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REPORT

OF

THE COMMISSION

ON

INDUSTRIAL AND TECHNICAL EDUCATION.

SUBMITTED TO THE SENATE AND HOUSE OF REPRESENTATIVES,
MASSACHUSETTS, IN ACCORDANCE WITH RESOLVE
APPROVED MAY 24, 1905.

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REPORT

OF THE

COMMISSION ON INDUSTRIAL AND TECHNICAL EDUCATION.

To the Honorable the Senate and House of Representatives.

In accordance with the provisions of chapter 94, Resolves of 1905, the undersigned were appointed by Governor William L. Douglas, June 7, 1905, a Commission on Industrial and Technical Education. The members of the Commission took the oath of office before Lieutenant-Governor Curtis Guild, Jr., June 9, 1905, and immediately thereafter met and organized by the choice of Mr. Wright as chairman, Mr. Reed as vice chairman and Mr. Golden as secretary. The resolve creating the Commission reads as follows: —

Resolved, That the governor, with the advice and consent of the council, shall, within thirty days after the passage of this resolve, appoint a suitable commission of nine persons, citizens of the Commonwealth, representing the manufacturing, agricultural, educational and labor interests, to serve for such compensation as the governor and council shall approve, to be known as the Commission on Industrial and Technical Education. Said commission may employ experts and all necessary clerical and other assistance, and may incur such reasonable expenses, including travelling expenses, as may be authorized by the governor and council. Before incurring any expense the commission shall from time to time estimate its probable amount, and submit the estimate to the governor and council for their approval, and no expense shall be incurred by the commission beyond the amount so estimated and approved. The commission shall report to the general court on or before the second Wednesday of January in the year nineteen hundred and six, with such recommendations for legislation as it may deem expedient. The powers of the commission shall terminate on the said second Wednesday in January. The commission shall investigate the needs for education in the different grades of skill and responsibility in the various industries of the Commonwealth. They shall investigate how far the needs are met by existing institutions, and shall consider what new forms of educational effort may be advisable, and shall make such investigations as may be practicable through printed reports and the testimony of experts as to similar educational work done by other states, by the United States government and by foreign governments. There may be expended from the treasury of the Commonwealth a sum not exceeding fifteen thousand dollars to carry out the purposes of this resolve: *provided, however,* that not more than five hundred dollars shall be paid in full for services rendered as compensation to any member of the commission. [*Approved May 24, 1905.*

The resolve called for a report on or before the second Wednesday in January. The time between the appointment of the Commission and the date set by the resolve was too short, and January 10, 1906, the Legislature extended the time until the second Wednesday in April.

For the purpose of making some parts of its investigation more complete, the Commission would have been glad of a longer extension of time; but it has endeavored to shape its work to the conditions, and respectfully submits the following as its report.

REPORT.

For the purpose of conducting the investigation required by the resolve, it was decided to hold public hearings in different parts of the State, and also through sub-committees to make inquiries into the leading industries of the State, namely, agriculture, boots and shoes, building trades, clothing, electrical apparatus, furniture, printing and book binding, textiles and watch making.

Early in the inquiry it became evident that the problem was two-sided. It was necessary to consider it from the side of the industries and the adult workman, and also, and more important, from the side of the children of the State who were to enter those industries. To promote these two interests is to promote the interests of the State.

A sub-committee was appointed, consisting of Mrs. Kehew as chairman, Mr. Reed and Mr. Martin, to make as thorough an investigation as time would allow into the industrial conditions and needs of children between the ages of fourteen and sixteen. The committee employed as an expert investigator Dr. Susan M. Kingsbury, a trained student of sociological problems. Dr. Kingsbury immediately organized a corps of assistants, and has conducted with unwearied industry and great skill the most thorough inquiry into the relations of children to the industries of the community which has yet been made in this country. The only limit to its value is in the want of time to extend it to all the children in the State.

The results of this inquiry are too extended to be contained in the body of this report, but will be found immediately following it, under the title of "Special Report on the Relations of Children to Industries," and the Commission invites its careful perusal.

Public Hearings.

Twenty public hearings were given, nine in Boston and one each in Brockton, Fall River, Fitchburg, Lawrence, Lowell, Lynn, New Bedford, North Adams, Pittsfield, Springfield and Worcester. The attendance at several of these hearings was large, notably at Springfield, North Adams and Fitchburg.

Taken as a whole, they represented a great variety of interests and callings, — manufacturers, business men, farmers, representatives of labor unions, school officials, principals and superintendents, and members of social organizations, men and women. In all, the Commission listened to one hundred and forty-three different persons.

The Commission was fortunate in having present at a special hearing by invitation Sir William Mather, M.P., of Manchester, Eng., widely known as the promoter of technical education in England, and equally well known for his intimate knowledge of industrial conditions in America and for his generous and sympathetic interest in American education. His account of the condition of technical education in England was so illuminating that the Commission has printed it in full, and has included it in an Appendix to this report.

To Mr. E. Swaysland of Northampton, Eng., the Commission was also indebted for an interesting account of the special education in England in the boot and shoe industry. This is also included in the Appendix.

From these hearings the Commission gained several very distinct impressions regarding matters included in the scope of its investigation.

1. There is a widespread interest in the general subject of

industrial education, or special training for vocations. This interest shows itself in two distinct forms, as manifested by two classes of people. There is, first, a general and theoretical interest felt by students of social phenomena and by expert students of education; and, second, a more practical and specific interest felt by manufacturers and wage earners. Men and women who have been brought into intimate contact with the harder side of life as it appears among the poorer people in the cities, who are grappling with the variety of problems of childhood to which city life gives rise, think they see in some form of industrial education a means of securing earlier and greater efficiency as wage earners, more self-reliance and self-respect, steadier habits of industry and frugality, and through these the opening of avenues to better industrial and social conditions.

The broader-minded students of education, men who look at their own work in the light of all its relations to society and to individuals, are coming more and more to feel that education is more than schooling of the old-fashioned type; and that for the fullest development of a child he must early and continuously be regarded as a member of the whole community, must be familiar with all its activities, and must be taught progressively to share in those activities, giving as well as receiving, producing as well as consuming, doing as well as learning. They see that this sort of training is used in the education of the feeble-minded, in the reformation of wayward and vicious children at reform and truant schools, and that it is being used to elevate the colored race in the south; and they ask why it may not be equally efficient in stimulating and directing the higher orders of mind, in preventing as well as curing juvenile delinquency, and in improving the social conditions of white as well as black children.

2. The hearings showed that, besides this general and theoretical interest, there is a practical and specific interest among manufacturers and wage earners because of a *personal need.*

The Commission was told at almost every hearing that in many industries the processes of manufacture and construction are made more difficult and more expensive by a lack of skilled workmen. This lack is not chiefly a want of manual dexterity, though such a want is common, but a want of what may be called *industrial intelligence.* By this is meant mental power to see beyond the task which occupies the hands for the moment to the operations which have preceded and to those which will follow it, — power to take in the whole process, knowledge of materials, ideas of cost, ideas of organization, business sense, and a conscience which recognizes obligations. Such intelligence is always discontented, not with its conditions but with its own limitations, and is wise enough to see that the more it has to give the more it will receive.

Manufacturers confidently believe that a system of industrial education wisely planned would tend to develop such intelligence, while it increased technical skill.

That large numbers among wage earners have the same faith was shown to the Commission by numerous representatives who testified before it, and by the statistics showing the number of men and women who are now availing themselves of existing opportunities. The numbers of workmen in the evening classes of the textile schools in this State; the experience of the Evening Trade School in Springfield and of those in New York and Philadelphia; the large classes maintained by the Young Men's Christian Association; and the enormous number seeking to advance themselves through technical education in the correspondence schools (a number estimated at fifty-five thousand in Massachusetts), — these facts prove conclusively that the interest is real and vital.

3. The Commission was made aware of a growing feeling of inadequacy of the existing public school system to meet fully the need of modern industrial and social conditions. The opinion was expressed by many speakers that the schools are too exclusively literary in their spirit, scope and methods. Where there was not a pronounced opinion, there was a vague feeling of dissatisfaction with results. This does not imply hostility. Everywhere the Commission found the people loyal to the purpose of the schools, and proud of the advanced position which the State has held, and they do not complain of the cost. They hesitate to criticise, and are far from desiring any revolutionary change; but they are inquiring with open minds whether some modifications may not be possible,

by which the schools may reach in a more practical way the great body of children and youth. This phase of the subject is discussed more at length in a later part of this report.

4. The Commission was not able to learn that even the people who are most interested in industrial education have any definite ideas as to its proper scope or method. One or two carefully considered plans were presented, and some practical suggestions were offered by Mr. Charles F. Warner, principal of the Technical High School in Springfield, whose communication is appended. With these exceptions, when the question was asked, "Have you any plan to propose for meeting the need of which you speak?" the answer was, "I have not thought so far," or "I leave that for the Commission to decide."

5. The Commission early became aware that its purpose and work encountered the suspicion and hostility of many of the labor unions of the State. This was expressed by individual members and by accredited representatives, and was evidently due to misapprehension. It was suspected that the Commission was created to formulate a plan for trade schools supported at public expense. The opposition to such schools is based on the fear that they would furnish workmen in numbers sufficiently large to affect the labor market, and bring about a lowering of wages. These schools are also opposed on the ground that they might furnish workmen ready to take the place of union men during the existence of a strike. "Scab hatcheries" is the significant term by which such schools are characterized. To such schools the labor unions declare themselves totally and unalterably opposed.

The objection urged by the unions is fully met by the closing paragraph of Sir William Mather's address: —

> Please take notice of what I said about the avoidance of teaching a trade to the extent of causing a lad to say, after leaving the industrial school, "I am a printer," "I am a cotton spinner," "I am a mechanic or a carpenter." In the first place, it is detrimental to the lad's own interests. He becomes somewhat conceited before he has got through the proper training by actual practice. It tends to deterioration of skill and intelligence in trades, which can only be fully acquired through work done on a commercial scale. It will tend to discredit industrial education.

6. To technical schools in distinction from trade schools the Commission found little opposition. In fact, many of the union men expressed themselves heartily in favor of schools which would offer to men already engaged in industries the opportunity to broaden their knowledge of the principles of their trade. This would tend to increase the efficiency of the workers in a given trade, while the closed door was maintained against outsiders.

At one or two of the hearings, individuals, while not opposed to technical education in this narrow sense, would not favor it, believing that American workmen are already sufficiently skillful and sufficiently intelligent. It was declared that they have nothing more to learn.

7. To the question, "If technical education were to be furnished, by whom should the expense be borne?" the most common answer was, "Wholly or partly by the State." There is a general feeling that the municipalities are already spending as much money as they can afford for educational purposes, and that any new department in the direction of industrial education which must be largely of an experimental nature should be undertaken by the State, or at least with substantial assistance from the State.

The Massachusetts System of Education.

Industrial and technical education cannot be considered apart from the general system of education out of which it must grow, and of which, if it is to be successful, it must form an integral part.

The original purpose of public education in Massachusetts was to fit its youth, through the learning afforded by schools, to be intelligent citizens.

The supreme problems which presented themselves to the leaders in early Massachusetts history were intellectual problems, — problems of Church and State. To establish and develop a self-governing community, under the new conditions which confronted them, demanded intelligence of a high order and widely diffused. These men, themselves educated in the most advanced learning of the time, saw in the study of classic languages and mathematics a means of developing the power of concentrated and sustained thought, of clear and logical reasoning and of balanced judgment. They believed that the study of the history and literature of the past tended to widen the horizon of thought, to bring to the solution of the problems of to-day the experiences of yesterday, so that successes and failures of other peoples in other times might serve as guides and warnings for people here and now. They called this a liberal education, — an education that liberated, that freed from the bondage to narrow and local prejudice, and made the vision of life keen and far-sighted.

Out of this purpose grew the colleges and the Latin schools, and for a similar purpose the universal common schools. This belief in the efficacy of learning, deeply rooted in the past, has never lost its hold upon the thought and the imagination of our people; so that the educational system based upon it, begun in poverty, has expanded with the means of the people until it has commanded the admiration of the world.

Whenever public interest has seemed to wane, ardent reformers have appeared who have stimulated or shamed the people into new efforts. But from the beginning the purpose has remained unchanged, — to promote intelligence as a basis of citizenship. The lavish expenditure upon common schools, high schools and colleges has this for its chief aim.

The schools had another but wholly subordinate function. Indirectly, they were expected to influence favorably all the callings in life. The more intelligent the person should become, the better workman he was likely to be, — more thoughtful, more careful, more considerate, more provident, more inventive; so that the system of education through schools was likely to promote the material prosperity of the State. That is what the early law makers meant when they coupled "learning and labor" as "profitable to the Commonwealth."

But special training for vocations was provided for by another system, — the system of apprenticeship, which included even the professions. Young men who would be lawyers or doctors or ministers learned the technique of their callings in the homes or the offices of older practitioners. Farming was learned by work on the farm, trades by work in the shops, and housekeeping in the home.

The two systems did not conflict with each other. The master was bound by the terms of the indenture to keep his apprentice at school. So the two forms of training went on simultaneously for several generations, each effective in its way, — general training through the schools, industrial training through apprenticeship. The child and the youth were never out of touch with the school of life, so that there never came a time of abrupt transition. There was no chasm.

The apprentice system is calculated for stationary conditions. It tends to conserve ancient traditions and methods, and cannot maintain itself in the face of change. Consequently and necessarily, with the development of modern science the old apprentice system waned and gradually disappeared.

Special training for vocations took its place, first, in the professions in schools of theology, of medicine and of law. The new idea was next applied to the preparation for teaching, and normal schools were established. The advent of railroads called for a new type of engineers, and technical schools were established. With the advent of the factory system, the introduction of machinery, the making of machines more and more automatic, the division and subdivision of labor, the apprentice system gave way in the trades and manufactures.

While this change in the vocations was going on, another change was also in process. The schools were gradually claiming more and more time. The school year was lengthened, school attendance was made compulsory, and the age limits were raised. Every day lost by the apprentice system was gained by the school, until imperceptibly under steady pressure the school came to stand alone as the only means of training, and the child came to be almost wholly separated from the ordinary activities of life.

In place of two systems of training, balancing each other and mutually co-operative, there came to be but one, absorbing all the time and thought and interest of the children and youth, — a system of education isolated and one-sided.

The effects of the giving up of the apprentice system have all been aggravated by the congestion of population in cities. City life instead of rural life, life in tenements and flats instead of in houses, together with the increase of wealth, have combined to deprive great numbers of children of those opportunities for industrial activity which were inseparable from life on the farm. Well-to-do people are everywhere lamenting that there is nothing for their children to do. The children are always receiving and never giving. Food, clothing, shelter, education, amusement, — all come to them as freely as the air and the sunshine.

The effects of these changes repeatedly brought to the attention of the Commission are not most serious where we might naturally expect in a lack of manual efficiency, though that is marked, but on the intellectual and moral side. There is a one-sided sense of values, a one-sided view of life, and a wrong attitude toward labor. Not having any share in productive labor, and being out of touch with it, the youth have no standards by which to measure time or possessions or pleasures in terms of cost. Many persons believe that about this point centre some of the gravest of present-day social problems.

Commercial Training.

An attempt has been made to retrieve a part of the lost ground, and to win back from the exclusive literary training of the schools some portion of time, by the introduction of what have been called commercial branches and commercial courses into the high schools. Arithmetic, book-keeping, including banking, commercial geography and commercial law, typewriting and stenography are included in the courses of most large high schools, and a special commercial high school is proposed for Boston.

With the introduction of these courses the whole question is yielded as to the right of the community to furnish special training for vocations, and the way is open into the broadest fields of industrial life.

Drawing.

At the World's Fair in Paris, in 1867, the manufacturers of England and America discovered that their wares were inferior to those of continental countries, especially in taste and design. The result of the discovery and of a subsequent inquiry into the cause of European superiority led some of the leading manufacturers and public-spirited people in Massachusetts to send the following petition to the Legislature in 1869.

It is reprinted here because it represents the beginning of a movement of which the appointment of this Commission is the latest step.

To the Honorable General Court of the State of Massachusetts.

Your petitioners respectfully represent that every branch of manufactures in which the citizens of Massachusetts are engaged, requires, in the details of the processes connected with it, some knowledge of drawing and other arts of design on the part of the skilled workmen engaged.

At the present time no wide provision is made for instruction in drawing in the public schools.

Our manufacturers therefore compete under disadvantages with the manufacturers of Europe; for in all the manufacturing countries of Europe free provision is made for instructing workmen of all classes in drawing. At this time, almost all the best draughtsmen in our shops are men thus trained abroad.

In England, within the last ten years, very large additions have been made to the provisions, which were before very generous, for free public instruction of workmen in drawing. Your petitioners are assured that boys and girls, by the time they are sixteen years of age, acquire great proficiency in mechanical drawing and in other arts of design.

We are also assured that men and women who have been long engaged in the processes of manufacture learn readily, and with pleasure, enough of the arts of design to assist them materially in their work.

For such reasons we ask that the Board of Education may be directed to report, in detail, to the next General Court, some definite plan for introducing schools for drawing, or instruction in drawing, free to all men, women and children, in all towns of the Commonwealth of more than five thousand inhabitants.

And your petitioners will ever pray.

JACOB BIGELOW.
J. THOMAS STEVENSON.
WILLIAM A. BURKE.
JAMES LAWRENCE.
EDWARD E. HALE.
THEODORE LYMAN.
JORDAN, MARSH & CO.
JOHN ARMORY LOWELL.
E. B. BIGELOW.
FRANCIS C. LOWELL.
JOHN H. CLIFFORD.
WM. GRAY.
F. H. PEABODY.
A. A. LAWRENCE & CO.

BOSTON, June, 1869.

The answer of the Legislature to this petition was given in 1870 by making drawing a required study in all the schools of the State, by requiring evening schools to be maintained in all towns and cities of ten thousand inhabitants for instruction in industrial and mechanical drawing, by appointing an art director, and by establishing a normal art school.

This provision aimed at a broadening of the general education of all the children, to make it less exclusively literary, and to furnish a kind of training which might be useful in industrial life; but it was not in any sense vocational. The result has been that drawing in the schools has become more and more exclusively cultural in its purpose and method, and the original industrial purpose has been largely lost sight of. This probably accounts for the fact that, notwithstanding drawing was intended to stand for a distinct contribution to the industrial interests of the State, it is still classed by many flippant writers and talkers among "fads," "frills" and "fancies."

The whole thought of the time was better expressed in a statute passed in 1872, authorizing the establishment and maintenance by any town and city of any sort of an industrial school as a part of its public school system. The statute reads as follows: —

> *Be it enacted, etc., as follows:*
>
> The city council of any city, or any town, may establish and maintain one or more industrial schools, and raise and appropriate the money necessary to render them efficient. Such schools shall be under the superintendence of the board of school committee of the city or town wherein they are established, and such board shall employ the teachers, prescribe the arts, trades and occupations to be taught in such schools, and shall have the general control and management thereof; *provided,* that in no case shall the expense of any such school exceed the appropriation specifically made therefor; and *provided,* that nothing in this act contained shall authorize the school committee of any city or town to compel any scholar to study any trade, art or occupation without the consent of the parent or guardian of such scholar, and that attendance upon any such school shall not take the place of the attendance upon public schools required by law. [*Approved March 9, 1872.*

That this law was in advance of public sentiment is clearly shown by the fact that no town or city has ever availed itself of its opportunity until Springfield in 1898 opened its evening trade school, and to-day that school stands alone.

But in this law the State committed itself in the broadest possible way to the policy of supporting special schools for vocational training at public expense.

When the exposition celebrating our centennial was held at Philadelphia, in 1876, there were brought together the manufactures of the different producing countries of the world. Germany then acquired an active interest in industrial and manual training, and so did England. Bismarck inquired of the officer in charge of the German exhibit at Philadelphia as to the effect of the comparison of German goods with those of other countries. The reply was: "Our goods are cheap and wretched." Germany had become the military equal of France, but she was not her industrial equal. France for years had been applying skill and the results of technical training in trades and in all industrial arts in her manufacturing establishments, through schools supported first by private benefaction and then by the government. France stood out at the centennial as superior to all other countries in those manufactured goods which displayed skill and training. Germany took her cue from this, and immediately entered upon a career which has brought her to the front rank in the production of goods both useful and artistic. England took her cue also. She had been fearing the competition of France. She had sneered at the technical training which had been in vogue in France, but she found all at once that in order to preserve her industrial supremacy she must not only be the equal of France in artistic designing and in the training in the application of superior skill, but that she must rise above France, — that she must surpass her in all things in which France had gained her celebrity. Then began the crusade for the establishment of training schools, the inauguration of manual training and industrial education in every direction, and England for a while held her supremacy. Other countries — Italy. Austria, the Scandinavian countries, Switzerland — applied skilled training in ordinary manufactures.

Manual Training.

While the general public has been strangely blind to the narrowness of the public school education, a few people more discerning have undertaken to restore in a measure the balance between manual and mental training which the old-time systems afforded.

This was the purpose of the law of 1894, which required cities of twenty thousand inhabitants to include manual training in their high school courses; and of the law of 1898, which extended the requirement to elementary schools of the same cities.

This law, containing no provision for its enforcement, is a dead letter in some of the cities and only partially carried out in several others.

The wide indifference to manual training as a school subject may be due to the narrow view which has prevailed among its chief advocates. It has been urged as a cultural subject mainly useful as a stimulus to other forms of intellectual effort, — a sort of mustard relish, an appetizer, — to be conducted without reference to any industrial end. It has been severed from real life as completely as have the other school activities. Thus it has come about that the overmastering influences of school traditions have brought into subjection both the drawing and the manual work.

Present Status of Vocational Training.

All the callings in life for which children and youth need to be specially prepared may be roughly grouped into four classes, — professional, commercial, productive and domestic.

Of these, the professional callings are sufficiently provided for, partly at public and partly at private expense. A large part of the burden of high school maintenance is incurred in the interests of professional callings.

The activities which may be classed as commercial, including all that have to do with the processes of distribution and exchange, are provided for largely at public expense. The schools send out salesmen, clerks, book-keepers, typewriters and stenographers in ever-increasing numbers. These are the occupations which allow clean hands and good clothes. If anything is lacking in this business training, it is special education in the principles and practice of expert salesmanship. A beginning of such instruction has been made in Boston.

Turning to the occupations engaged in production, in distinction from distribution, we find that these are only touched educationally in their most advanced and scientific forms. No instruction whatever is furnished at public expense in the principles or practice of farming, dairying, gardening, the building trades, cabinet making, machine shop practice, boot and shoe making, tanning, printing, book binding, dressmaking, millinery, embroidery, design.

Agriculture is recognized by the State in its aid to the Agricultural College at Amherst; but there is no preparatory work leading up to it, in the same way as the high schools lead up to the other colleges.

Manufacturing is recognized by the State in so far as it aids by scholarship and direct grants the Massachusetts Institute of Technology and the Worcester Polytechnic Institute. These institutions train mechanical and electrical engineers, manufacturing chemists, and architects, — men in the highest ranks of productive industrial life.

For these institutions the high schools offer some preparation in their scientific courses. The institutions themselves have fully justified all that they have cost. Their fame is world-wide, and the State is honored by them.

Manufacturing interests are still further aided by the recently established textile schools at Lowell, opened in 1897; at New Bedford, opened in 1899; and at Fall River, opened in 1904. These schools, in their organization, mode of support and general methods, might well serve as models for higher technical schools in other industries. The schools have been established by the State and the city. They are supported partly by annual grants by the State and the city, and partly by tuition fees from the students. They are governed by bodies of permanent trustees, some of whom represent the Commonwealth. The cities are represented in the government by certain *ex-officiis* trustees.

OTHER OPPORTUNITIES FOR TRADE EDUCATION.

The Massachusetts Charitable Mechanic Association maintains an evening trade school for young men, most of whom are regularly employed as apprentices or helpers in the trades they are studying.

There are classes in masonry, carpentering, plumbing and sheet metal work, including about one hundred students. A small part of the expense of the school is met by fees from the students.

The Women's Educational and Industrial Union of Boston maintains day classes in millinery, wire frame making and salesmanship. Some of these are distinctively trade classes; others are of a more general character.

The Boston Trade School for Girls is supported by a society of women who rely upon donations from interested people to meet the expenses. There are no fees from the students. Girls are instructed in dressmaking, millinery and machine operating in all-day classes.

The Wells Memorial Institute maintains free evening classes in electricity, steam and steam engines, mechanical and machine drawing, household science, millinery, dressmaking and photography. There were registered in these classes in 1905 twelve hundred and twenty persons.

The Boston Young Men's Christian Association maintains what it calls an evening institute, which includes four separate schools of a technical character, — a school of commerce, a polytechnic school, a school of applied electricity and steam engineering, and an automobile school. Each of these schools includes numerous departments. The number of students is large. The Young Men's Christian Associations throughout the State support evening classes in various technical subjects. In all these classes the students pay a part of the cost of the instruction.

The Boston North End Union, a charitable organization, maintains evening classes in plumbing and day classes in printing. The North Bennet Street Industrial School conducts evening classes in sewing and printing, reaching in all about forty men and two hundred women.

Besides these, instruction in wood working, printing, clay modelling, cooking, sewing and other forms of industrial training is given to classes of children by churches of different orders; and there are in different parts of the State private schools or classes for persons employed in different trades, as in some of the sub-divisions of boot and shoe making, steam and electrical engineering, etc.

These efforts of a private or philanthropical character serve to show the need of industrial education in the State, rather than to supply it in any adequate measure.

Industrial Education in Europe.

Compared with the opportunities afforded in Europe for acquiring knowledge and skill in productive industry, the work now being done in Massachusetts, as shown above, is strikingly and painfully inadequate.

To the average American, who has been accustomed to believe that progress is only to be found in his own country, and to speak of the nations of the old world as effete, the study of the systems of industrial education in Continental Europe is bewildering. The scope of this education is so broad, its forms are so multifarious, its methods are so scientific, its hold upon public opinions is so complete, the impulse which it is giving to industrial leadership is so powerful, as to entitle it to the most thoughtful and respectful study.

An exhaustive account of this work is found in the seventeenth annual report of the United States Commissioner of Labor (1902), and a special report on Industrial Education and Industrial Conditions in Germany was published by the United States Department of Commerce and Labor in 1905.

A brief abstract of these reports for several of the countries of Europe is appended to this report. Attention is called to: —

1. The union of national with municipal support and control.

2. The activity of private associations, both of manufactures and of trades.

3. The provision for both day and evening schools.

4. The stimulus of State aid to private enterprise.

5. The universal recognition of the necessity of special education for every form of industrial life.

CONCLUSIONS.

As a result of the public hearings and the special investigations,[1] the Commission has arrived at the following conclusions: —

1. For the great majority of children who leave school to enter employments at the age of fourteen or fifteen, the first three or four years are practically waste years so far as the actual productive value of the child is concerned, and so far as increasing his industrial or productive efficiency. The employments upon which they enter demand so little intelligence and so little manual skill that they are not educative in any sense.

For these children, many of whom now leave school from their own choice at the completion of the seventh grade, further school training of a practical character would be attractive and would be a possibility if it prepared for the industries. Hence any scheme of education which is to increase the child's productive efficiency must consider the child of fourteen.

2. Children who continue in school until sixteen or eighteen, especially if they complete a high school course, are able to enter upon employments of a higher grade, usually in mercantile pursuits, and they are able by reason of greater maturity and better mental training to learn the technique of their employment in a shorter time; but they are wholly lacking in manual skill and in what we have called industrial intelligence. For the purpose of training for efficiency in productive employments the added years which they spend in school are to a considerable extent lost years.

In the cases of both classes of children the employment upon which they enter on leaving school is determined by chance.

3. The productive industries of the State, including agriculture, manufactures and building, depend mainly upon chance

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[1] For a summary of the results of the special investigation on the Relations of Children to the Industries, see pages 85–93.

for recruiting their service. A few apprenticeships still exist in a few industries or parts of industries, but very few apprentices are indentured, and many so-called apprenticeships are falsely named.

The knowledge and skill which the new men bring to the service of any industry is only what they have picked up in a haphazard way. Some bring much and many bring little.

4. This condition tends to increase the cost of production, to limit the output in quantity and to lower the grade in quality. Industries so recruited cannot long compete with similar industries recruited from men who have been technically trained. In the long run that industry, wherever in the world it is located, which combines with general intelligence the broadest technical knowledge and the highest technical skill, will command the markets of the world.

5. The industries of Massachusetts need, in addition to the general intelligence furnished by the public school system and the skill gained in the narrow fields of sub-divided labor, a broader training in the principles of the trades and a finer culture in taste as applied to material, workmanship and design. Whatever may be the cost of such training, the failure to furnish it would in the end be more costly.

6. The State needs a wider diffusion of industrial intelligence as a foundation for the highest technical success, and this can only be acquired in connection with the general system of education into which it should enter as an integral part from the beginning.

The latest philosophy of education re-enforces the demands of productive industry by showing that that which fits a child best for his place in the world as a producer tends to his own highest development physically, intellectually and morally.

7. The investigation has shown the increasing necessity for a woman to enter the industrial world for the sake of self-support, and hence that she should be prepared to earn a respectable living wage, and at the same time that the attempt should be made to fit her so that she can and will enter those industries which are most closely allied to the home.

The investigation has shown that that vocation in which all other vocations have their root, namely, the care of the home, has been overlooked in the modern system of education. In order that the industrial life of the community may be vigorous and progressive, the housekeepers need to be instructed in the laws of sanitation, in the purchase, preparation and care of food, and in the care of children, that the home may be a home, and not merely a house.

RECOMMENDATIONS.

The Commission does not deem it to be a part of its duty under the provisions of the resolve creating it, and in fact it is not in the power of a temporary commission, to formulate exhaustive and specific plans for industrial education, but rather to ascertain and exhibit the needs of such education and to point out how the State may make effective its existing policy, and to suggest means for the further industrial development of the State.

There seem to be two lines in which industrial education may be developed, — through the existing public school system, and through independent industrial schools. In regard to the former, the Commission recommends that cities and towns so modify the work in the elementary schools as to include for boys and girls instruction and practice in the elements of productive industry, including agriculture and the mechanic and domestic arts, and that this instruction be of such a character as to secure from it the highest cultural as well as the highest industrial value; and that the work in the high schools be modified so that the instruction in mathematics, the sciences and drawing shall show the application and use of these subjects in industrial life, with especial reference to local industries, so that the students may see that these subjects are not designed primarily and solely for academic purposes, but that they may be utilized for the purposes of practical life. That is, algebra and geometry should be so taught in the public schools as to show their relations to construction; botany to horticulture and agriculture; chemistry to agriculture, manufactures and domestic sciences; and drawing to every form of industry.

The Commission would also recommend that all towns and cities provide by new elective industrial courses in high schools instruction in the principles of agriculture and the domestic and mechanic arts; that in addition to day courses cities and towns provide evening courses for persons already employed in trades; and that provision be made for the instruction in part-time day classes of children between the ages of fourteen and eighteen years who may be employed during the remainder of the day, to the end that instruction in the principles and the practice of the arts may go on together.

In regard to the second method of developing industrial education, and in view of the facts already stated and the conclusions reached by the Commission, the Commission submits for the consideration of the Legislature the following draft of a bill as embodying its recommendations: —

AN ACT TO PROVIDE FURTHER FOR INDUSTRIAL EDUCATION.

Be it enacted, etc., as follows:

SECTION 1. The governor, by and with the consent of the council, shall appoint a commission of five persons, to be known as the Commission on Industrial Education, to serve for the term of five years and without pay. The said commission on its organization shall appoint a secretary to be its executive officer, who shall not be a member of the commission, and who shall receive an annual salary of thirty-five hundred dollars; and the commission may employ supervisors, experts in industrial and technical education, and such clerical and other service as may be found necessary. The necessary expenses of the commission, including clerk hire, travelling expenses, stationery and all other incidental expenses, shall be paid out of the treasury of the Commonwealth, as may be provided by law.

SECTION 2. The commission on industrial education shall be charged with the duty of extending the investigation of methods of industrial training and of local needs, and it shall advise and aid in the introduction of industrial education in the independent schools, as hereinafter provided; and it shall provide for lectures on the importance of industrial education and kindred subjects, and visit and report upon all special schools in which such education is carried on. It may initiate and superintend the establishment and maintenance of industrial schools for boys and girls in various centers of the state, with the co-operation and consent of the municipality involved or the municipalities constituent of any district to be formed by the union of towns and cities as hereinafter provided. The commission shall have all necessary powers in the conduct and maintenance of industrial schools, and money appropriated by the state and municipality for their maintenance shall be expended under its direction.

SECTION 3. All towns and cities may provide independent industrial schools for instruction in the principles of agriculture and the domestic and mechanic arts, but attendance upon such schools of children under fourteen years of age shall not take the place of the attendance upon public schools as required by law. In addition to these industrial schools, towns and cities may provide for evening courses for persons already employed in trades, and they may also provide, in the industrial schools and evening schools herein authorized, for the instruction in part-time classes of children between the ages of fourteen and eighteen years who may be employed during the remainder of the day, to the end that instruction in the principles and the practice of the arts may go on together: *provided,* that the independent schools authorized in this section shall be approved as to location, courses and methods of instruction by the commission on industrial education.

SECTION 4. Two or more cities or towns may unite as a district for the maintenance of the industrial schools provided in the preceding section, but no such district shall be created without the approval of the commission on industrial education.

SECTION 5. Whenever any city or town or any district, as provided in the preceding section, shall appropriate money for the establishment and equipment and maintenance of independent schools for industrial training, or shall institute new day or evening industrial courses in high or manual training schools, the state, in order to aid in the maintenance of such schools or new industrial courses, shall pay annually from the treasury to such towns, cities or districts providing industrial courses a sum proportionate to the amount raised by local taxation and expended for the support of schools for each thousand dollars of valuation as follows: towns and cities expending more than five dollars for each thousand of valuation for the support of public schools to be reimbursed by the state to the amount of one-half, those raising and expending between four and five dollars per thousand to an amount of one-third, and those raising and expending less than four dollars per thousand to an amount of one-fifth, of the cost of maintaining industrial courses or industrial schools: *provided,* that no payment to any town or city shall be made except by special appropriation of the legislature.

SECTION 6. The commission on industrial education shall make a report annually to the legislature relative to the condition and progress of industrial education during the year, what industrial schools have been established and the appropriations necessary for their maintenance, in accordance with the preceding section, and such other recommendations as the commission on industrial education may deem advisable; and especially shall the commission consider and report at an early day upon the advisability of establishing one or more secondary technical schools for boys and girls, providing for a three or four years' course for extended training in the working principles of the larger industries of the state.

SECTION 7. The trustees of the Massachusetts agricultural college are hereby authorized to establish a normal department for the purpose of giving instruction in the elements of agriculture to persons desiring to teach such elements in the public schools, as provided in sections three and four: *provided,* that the cost of such department shall not exceed the sum of five thousand dollars in any one year, and that at least fifteen candidates present themselves for such instruction.

SECTION 8. Section ten of chapter forty-two of the Revised Laws of the Commonwealth, and all acts and parts of acts inconsistent with this act, are hereby repealed.

The Commission recognizes that there should be no interference with the public school system as it exists by a separate authority having co-ordinate powers with those of the Board of Education, yet it believes that the elements of industrial training, agriculture, domestic and mechanical sciences should be taught in the public schools, and, as already stated, that there should be, in addition to this elementary teaching, distinctive industrial schools separated entirely from the public school system. The foregoing recommendations, together with the bill embodying the views of the Commission as to separate industrial schools, solves this problem.

Instruction in public elementary and high schools would naturally and logically lead to the entrance of students on the work of the independent industrial schools; and the Commission on Industrial Education, as recommended, would deal solely and entirely with such schools, thus abrogating the act of 1872 (section 10 of chapter 42 of the Revised Laws), leaving the school authorities on their own initiative to introduce new industrial courses in the public schools. This avoids conflict, and insures harmony and a development of the system of industrial training so much to be desired.

The Commission in its consideration has endeavored to preserve the integrity of the public school system, to enrich it along industrial lines, and expand it along vocational lines through independent industrial schools. This seems necessary because the present public school system is aimed primarily to secure cultural and not industrial or vocational effects, while the departure recommended by the Commission relative to independent industrial schools secures a development of the principles of industrial instruction, and entirely in accordance with the policy to which the State is already fully committed through its support of normal schools, art schools, institutes of technology and textile schools. The act of 1872, except in the city of Springfield, has remained a dead letter, but the State aid provided by the foregoing plan would, the Commission believes, induce other municipalities to enter upon a like beneficent experience.

In order to secure proper instruction for teachers in the elements of agriculture, there seems to be a necessity for some normal department or separate normal school. The Commission has considered two propositions: one to establish a normal school in the Agricultural College, and another to establish a separate normal school. The Agricultural College has the plant and all the facilities for giving instruction in the elements of agriculture to those desiring to become instructors in such elements. It has therefore been considered the wiser plan to recommend a normal department in the existing Agricultural College, thus saving expense and avoiding the necessity of duplicating plants. It is undoubtedly a fact that some of the seniors in the Agricultural College are qualified to give instruction, thus utilizing the facilities of the college.

In conclusion, the Commission is perfectly sensible of the fact that no comprehensive plan for securing industrial education can be created by the fiat of the Legislature; such plan must be the result of practical experience, growing out of experiments. This is the aim in the foregoing report and recommendations.

CARROLL D. WRIGHT, *Chairman.*
WARREN A. REED, *Vice-Chairman.*
JOHN GOLDEN, *Secretary.*
MARY MORTON KEHEW.
GEORGE H. MARTIN.
NATHANIEL I. BOWDITCH.
JOHN P. MURPHY.
SIMEON B. CHASE.
GEORGE E. KEITH.

REPORT OF THE SUB-COMMITTEE

ON

THE RELATION OF CHILDREN TO THE INDUSTRIES.

Investigation conducted by
SUSAN M. KINGSBURY, Ph.D.

I. THE PROBLEM.

It has been said that the years from fourteen to sixteen are the "wasted years" of the child's life. The application was made to the child who enters upon his industrial career at such an age, and when we find that 25,000 of the children of the State of Massachusetts are at work or idle at those ages, we are led to believe that this is the most important question which faces the educational world to-day.

The State releases the child from its educational authority at fourteen, and the child who is no longer interested in the inactive school life, or who feels the stress of necessity for self-support, is forced to search for an opportunity to fit himself for industrial responsibilities. What awaits him? No schools exist which offer practical training until he is at least sixteen or eighteen, and even then they are few in number and usually at a great distance from the child's home. He must turn to the "practical school of life" and seek employment, only to find that the doors of those industries which would afford him an opportunity "to pick up a trade" are not open to him until he is sixteen, or usually eighteen years of age, while very few of the so-called apprenticeships receive him under eighteen. Even in the unskilled industries of the better class, proprietors are becoming more and more averse to the employment of the younger child. The result is that he drifts into an unskilled industry, or into one which is undesirable in character.

Are these years wasted? It is to answer this question that this committee was formed, and in its endeavor to do so it has studied the subject under the following heads: —

First. — What the children of fourteen and fifteen are doing throughout the State.

Second. — What the educational and economic value of these years has been to the child at work.

Third. — What the educational and economic value of these years might be.

Fourth. — What the economic status of the parents of these children is, and how necessary is the income of the child.

Adequate conclusions cannot be reached without a close personal study of the factory, of the school, and more especially of the home. Furthermore, these questions cannot be answered without a knowledge of a large number of industries of every grade, a study of several communities of every type, and personal visits to many families of every class. Consequently, this investigation has been conducted in 43 of the cities and towns of the State, in every section of the State, and has followed 5,459 children into 3,157 homes and into 354 establishments, representing 55 industries.

In order to study the environment of the child, we have personally visited the homes of children at work under twenty years of age, and, by interviewing the parent, usually the mother, we have been able to learn: —

First. — The school history of the child, — that is, the age when he left school; the grade completed; the reason for not continuing longer in school; and upon whom should rest the responsibility of his leaving.

Second. — The industrial history of the child, — that is, the various employments in which the child has been engaged; the wages received; and the advance in a single industry or the change from one industry to another, with the consequent effect on his stability of character.

Third. — The financial and social status of the family, including the size of the family income, the proportion of income which is derived from the children, and certain constant expenditures such as rent and car fares.

Fourth. — The thrift, industry and ambition of the family.

Fifth. — Especially the attitude of child and parent toward continued education, and the ability of the parent to afford such opportunities to the child.[1] This decision in every case has taken into consideration the appearance of the home and of the parent, and the per capita income exclusive of rent, including each member of the family from youngest to oldest. Furthermore, the present or past expenditure of money for educational purposes, such as music lessons and business courses, has been a guide.[2]

The query naturally arises as to the reliability of information obtained from the home, but several facts make us confident that the statements made by parents are true: first, the repetition of rents on the same street or in the same community; second, the repetition of wages in the same industry; and third, the repetition of experience from home to home. But the most convincing proof that the mother has answered truthfully the questions concerning her home and her child comes from the continued impressions received by the five investigators who have visited the homes of 3,157 families, and taken the record of the industrial history of 5,459 individual boys and girls who are at work under twenty-four years of age.

When we state that this represents an acquaintance with the home conditions of a number equal to about one-fifth of the children who are employed at fourteen and fifteen years of age throughout the State, we feel that we are justified not only in claiming the truth of the statements presented, but also in declaring that we have gained a true picture of conditions in every section of the State.[1]

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[1] The investigation has been made by five young women, four of whom are college graduates, who were especially fitted to gain the confidence of the parent and to portray the points of vital importance with regard to the conditions, attitude of mind and financial status of the family.

[2] In grading the families, the term good grade has been used to describe the thrifty, comfortable home, in which the family weekly income, exclusive of the rent paid, is $3 or over per person. The low-grade family is one which is shiftless and unambitious, with a per capita income of less than $2. The wages of the children between fourteen and sixteen are omitted.

We have not, however, been content with the information received from parents, but have gone into the industry, and have interviewed employer, superintendent, or foreman, to discover what the children were doing; what value their work has been both as to education and as to wage; what has been their stability and their productive value; what opportunity for advancement existed in wage or position; and what better opportunities might have come with better education.

The veracity of such returns might again be questioned; but the unfailing courtesy of employers and superintendents in their endeavor not only to answer the questions asked, but also, in many cases, to aid the investigator to get at the truth by opening their books, by furnishing addresses of employees and by permitting the visitor to interview foremen, second hands or employees throughout the factories, has convinced us that employers have been quite as accurate as parents. Furthermore, similarity of the returns gained from the visitation of 354 firms, representing 55 different industries, in 43 cities of the State, scattered from North Adams to New Bedford, attest the validity of our conclusions.[2]

The printed returns from the public and parochial schools do not give the facts essential to a knowledge of this subject; therefore we have discovered, by correspondence with all of the superintendents of schools in the State or superiors of the parochial schools, the age and grade at which the children leave school, and the proportion which continues in the high school and that which leaves during the grades, after graduation from the grammar grades or during the high school.[3]

It may be a matter of interest to many to know how the names of individuals and of firms were obtained for this work. The age and schooling certificates, filed in offices of superintendents of schools, and lists secured from employers, furnished addresses for children under sixteen, while the latter resource alone was available for those over sixteen. In Boston, Lowell and North Adams the addresses of those leaving school were obtained from the schools, and in Cambridge and Lowell addresses were secured from the census.[1] The names of firms came from the records of age and schooling certificates, from directories, and as a result of personal inquiry in the several cities.

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[1] Many of the individuals investigated are between seventeen and twenty years of age, since it has been our purpose to discover the history for five or six years of those beginning work under sixteen years of age. Nevertheless, these individuals represent conditions of an equal number of those at present under sixteen who are at work, since 81 per cent. of them began work under sixteen.

[2] For a detailed statement of the cities visited, the kinds of industries and the number of firms in each industry studied, and the number of individuals investigated in each industry, see tables Nos. 1 and 2.

[3] Returns were received from school superintendents of districts representing 90 per cent. of the total population of the State, and from two-thirds of the parochial schools.

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[1] An act of the Legislature, permitting the census office to furnish these lists, enabled a large number of returns to be secured during the last month of the work. It is unfortunate that it was impossible to obtain such a privilege earlier. See Acts and Resolves, 1906.

The lists which were taken from the employment tickets were apt to be unsatisfactory, since in many of the cities the name of the industry which the child entered and the address of the child were not preserved at all, and in almost every city such data earlier than 1903 had been destroyed. Furthermore, the addresses were often found to be unreliable, and the names of the employers or foremen illegible. As a result, lists of those employees who are at present twenty years of age or under have been obtained from the firms. In addition, for the purpose of reaching all classes of families and all sections of certain cities, — Boston, Lowell and North Adams, — the names of all children who have left school to go to work have been secured from the head masters of schools in better districts, and also the names of the graduates of the grammar grades who have not gone to the high school, but have commenced work.

II. WHAT CHILDREN ARE DOING.

It is persistently asked, How many children between fourteen and sixteen are at work in the State? This is a fact which has never been known. The arrangement of age periods in the census of 1895 fails to afford the data, and the figures given in the volume of manufactures of the 1900 census for some 20 cities refer to employments in manufactures only. But an estimate based on the special returns received from superintendents of schools for this investigation shows that 25,000 of the children of the State are at work or are idle. This is corroborated by estimates based on the manufacturing volume of the 1900 census and on the Lowell census.[1]

The question as to what preparation these children have had before they assume responsibilities is quite as important as what kind of work they enter. It is unfortunate that so many of our children are thrown upon the world at fourteen or fifteen, but it is more unfortunate that only about one-sixth of these have graduated from the grammar schools.[2] Do we wonder that the constant cry of employers is for more intelligent workmen, when we find that, of the children at work between fourteen and sixteen, five-sixths have not had the training of the grammar schools, over one-half have not passed

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[1] This percentage is borne out by the returns of the Lowell census for 1905, especially prepared for the Commission by the Bureau of Statistics of Labor: —

CITY.	Foreign Born.	Native Born.	Totals.
Lowell: —			
At work at fourteen,	183	269	452
At work at fifteen,	318	658	976
	— 501	— 927	— 1,428
At school at fourteen,	127	995	1,122
At school at fifteen,	55	519	574
	— 182	— 1,514	— 1,696
Total number of children,	683	2,441	3,124

[2] This is necessarily a rough estimate, based on the number graduating for two years, the number entering the high school for two years, and the per cent. of graduates that are fifteen years or under.

beyond the seventh grade, and one-quarter have had less than six years of schooling?[1]

Viewing the subject from another point, we find that the industrial world claims three-quarters of the graduates of the grammar grades with no further preparation, except the small minority who have had a year or two of high school work.[2]

It remains to discover what industries these 25,000 children are entering, before we attempt to follow them into their homes and their work, in order to decide upon the adequacy of their preparation, and upon the meaning to them of such years spent in the industrial world.

Thirty-three per cent. of the children of this State who begin work between fourteen and sixteen are employed in unskilled industries, and 65 per cent. in low-grade industries; thus a little less than 2 per cent. are in high-grade industries.[3] This statement in itself, however, does not reveal the exact situation, even as far as these selected groups are concerned, since carpet, woolen and knitting mills claim the greater part of the children in low-grade skilled industries. These industries are not as desirable as many of the other low-grade industries, such as jewelry, pamphlet binding, machine operating, and work with toys in which children under sixteen are not received.

Should we classify all of the mills with the low-grade skilled industries, we should find 69 per cent. of the children in these undesirable industries, and but 26 per cent. in the low-grade skilled industries.[1]

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[1] Statement of the age and grade of those at fourteen and fifteen who leave school before graduation: 39 per cent. of those who do not graduate leave at the close of the sixth grade, or before; 64 per cent. of those who do not graduate leave at the close of the seventh grade, or before; 89 per cent. of those who do not graduate leave at the close of the eighth grade, or before. (See tables Nos. 5 and 6.)

[2] Statement of the proportion of graduates of the grammar grades which enters the high school, goes to work at once, or drops out of the high school: 81 per cent. of those who graduate from the grammar grades enter the high school; 80 per cent. of those who graduate from the grammar grades are under sixteen years of age; 50 per cent. of those who enter the high school drop out within one or two years; 60 per cent. of those who graduate from the grammar grades enter the business world without graduating from the high school, probably within one or two years. (See Table No. 6.)

[3] The number of children found in the various industries through our investigations are as follows: Unskilled industries, — juvenile, 413; mills, 2,387; factories, 709. Low-grade skilled industries, — mills, 1,786; factories, 1,862. High-grade skilled industries, — shops of mechanical trades, etc., 900. Total, 9,057.

It is essential, even at the expense of time and space, to understand the grade of the work required in the various occupations of the several industries, before we can know what it means for the child to be employed in the unskilled or low-grade skilled industry and to be excluded from the high-grade skilled industry during the years of adolescence.

Unskilled industries are here arbitrarily classified as those in which the work is the repetition of a single or simple operation, easily learned in a short time, and in which the knowledge of one part is not essential to that of another. Consequently, the grade of ability and responsibility required is low, and the wages correspondingly low.[2] Such industries have been subdivided, for convenience, into three groups: juvenile employments, factories requiring unskilled work, and mills. The former is an employment in which children only are wanted, because physical development is a disadvantage. Hence they remain for two or three years at the most, on account of the low wages paid. Among these industries are department stores, messenger service, and errand work in offices and small stores. It is true that in the mills or factories, classified as unskilled, the children perform the most unskilled work, and that there may be a few advanced positions which are desirable; but the work of the lower occupations is of such a character that it does not serve as a training, and seldom leads up to the skilled occupation. The routine tending of a machine or speed alone counts, and one occupation is often as lucrative as another.[3]

Among the low-grade skilled industries, the mill industries are similar in character and influence to those of the unskilled industries; but the difference exists in the cleaner and more desirable conditions of work, in the greater care required in similar processes, and in the existence of a larger number of skilled occupations in the industry into which the ambitious employee may force himself. Consequently, the grade of employees is higher, children under sixteen are being refused more and more, employees constantly endeavor to pass from the mill of lower grade to that of the higher, and the wages for similar occupations are greater.

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[1] These estimates are made on the number of children found in the industries during our investigation. For a detailed statement, see tables Nos. 1 and 2, which will also show how representative is the number of firms visited in each grade of industry. These percentages are borne out by the returns from schooling certificates, and the proportion of employers who will and will not receive the child under sixteen or under eighteen. (See tables Nos. 3 and 7.)

[2] For a discussion of the three grades of occupations in the various industries, see the Appendix to the volume on "Employees and Wages," Federal Census, 1900.

[3] The classification of industries arbitrarily adopted in this discussion will be found in Table No. 1. These industries include cotton mills, can, rivet and stud, cork, thread and twine, glue, confectionery, and paper factories, and all kinds of assembling and packing.

The factory group of this class is of distinctly higher grade than in the unskilled industries. But it should be again subdivided, since some of these industries are more desirable than others, and the less desirable class alone is open to the child under sixteen. The work in the low-grade skilled factories, in comparison with the factories of the unskilled group, is rather that of running a machine than simply tending one, since the management requires a greater knowledge and greater skill or care. Thus we find that a girl who makes underwear, or gloves, or vamps of shoes, must have greater skill and must be more careful and responsible than one who feeds paper into an envelope machine, or makes a paper box by machine. Similarly, a boy who burnishes or heels a shoe is not to be compared with one who feeds tin into a can cutter. In hand work the difference is also apparent. The girl who burnishes or solders a link of a watch chain requires a greater deftness and care than one who dips chocolates or packs candy or crackers. In the less desirable low-grade industries there may be departments at the top requiring a much higher grade of skill, or even those in which the occupation may be termed skilled. But in the more desirable class the skill required in the occupation varies, and the knowledge of one grade may lead to advancement to a higher grade in the same industry or in other industries, with a corresponding increase of wages. Expert work in the occupation may in time mean recognition as an expert, with advantageous results. Examples of such industries are those in which the running of a power stitching machine is an occupation. Thus girls often learn to operate a power stitching machine in a hosiery or knitting mill, and pass into the shoe business to make linings or vamps, where the pay is much better. A man in a chair factory becomes acquainted with woods and the simple principles of wood working, and may soon become a cabinet maker or a wood worker in some other skilled trade.

These low-grade skilled industries do not require a knowledge of all processes to be a first-class workman nor do the operations require a great amount of skill, and they are usually learned in a few months at the most. Here lies the distinction between this grade of industry and the high-grade skilled industry.[1] In the latter a high grade of skill is required in any one occupation, and must be acquired by some years of training or experience. Or an acquaintance by the employee with one occupation in the industry is often essential to the knowledge of another, while skill in all parts of the business must be had by a large number of employees. Such were formerly the requirements in many of the industries which the introduction of specialized work and machines has reduced to a second grade. Thus the shoe business may be a high grade of industry to the boy who forces his way from machine to machine; and it might be so classed, were it not that the great majority of workers remain content with a knowledge of one operation, due to the greater wage received by virtue of greater speed, as in many other occupations. Most mechanical trades have passed or are passing through a similar evolution. This classification has grouped such trades as high class, regardless of the number of employees who are in a low-grade occupation, for two reasons: because there are more apprentices in such trades, and because the opportunity for the ambitious individual to pick up a trade and force his way to the top is greater.

Our investigations have shown, therefore, that the grades of industry entered by the child between fourteen and sixteen are of the lowest order. What we have found to be the effect upon the development of the child and upon his industrial career, is to be the burden of this discussion.

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[1] In the low-grade skilled industry are included woolen mills, hosiery and knitting mills, factories for making ready-made garments, rubber shoes, leather binding, pamphlet binding, wooden boxes and toys, boots and shoes, and jewelry. In the high-grade skilled group are all kinds of mechanical trades, building trades, and custom order work.

III. WHAT THE YEARS IN INDUSTRIAL LIFE MEAN TO THE CHILDREN.

TEXTILE CENTERS.[1]

North Adams.

In the city of North Adams 356 children between the ages of fourteen and sixteen secured certificates to enable them to go to work during 1904–05. The school records tell us that fully 70 per cent. of these children went into the cotton industry and 10 per cent. more into woolen mills. A few of the rest entered a shoe factory, and the others entered scattered industries. Having obtained from the head masters the addresses of the 190 children who had dropped out of the public schools during the year, we sought personal interviews with the parents, to discover the conditions and needs of these children; and we did not neglect the parochial school element, since many of them were included in an additional list of 50 given to us by one of the largest cotton firms in the city. We found 167 families "at home," but since we secured the history of all of the children in these families who were over fourteen and under twenty-four, we have returns on 257 working children.[2]

Let us consider first the children found in the cotton mills.[3] The story of these children and their homes is the story of the better element of cotton employees in most of the cities. Largely foreign in nativity, — French Canadian in North Adams, — the children begin work at an early age, and enter the mill because it is the only industry open to them. Barely one-fifth of these children have older members of the family in the cotton industry. It is not a matter of family occupation, but rather of necessity, since the aim of family after family is to have the children in better employments than cotton.

But what does the child gain, having entered this industry?

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[1] For a list of all the textile centers visited, see Table No. 2. Also, in Table No. 3 will be found the statistics of the employments entered by the children in the various cities, which were obtained from the age and schooling certificates issued by superintendents.

[2] Only 75 of these began work when over sixteen years of age.

[3] They were 104 in number.

In wage the boy starts with $3.50 and the girl with $4, and both reach a maximum average of $5 or $6 within two or three years. Doubtless an able few pass beyond this amount; but when the "slack" time is considered, it is the second hand or foreman only who averages over $8, except among the weavers, and the pay roll of these mills shows that weavers are the highest paid of the purely textile operatives. In North Adams the child at work two years is not apt to earn over $6. Hence the child under sixteen is worth to his parent between $3.50 and $6, regardless of what he may be worth to his employer. It is this sum which the parent must forego if he wishes to keep his child in school.[1]

It is significant that children who enter this unskilled industry remain in it, although there is a constant shifting from mill to mill. For 86 out of 90 to have remained in one industry over six months and 68 over one year is unusual for children who enter work under sixteen; and for 75 per cent. to have remained in one firm the entire period of the two years or more of their industrial career will prove that the greater permanence of the employment is in decided contrast to the influence of many other unskilled industries. But this persistence in the occupation is its very evil. "To find the way out" or "up" is almost impossible. This is witnessed by these figures, as well as by the testimony of many textile workers.

But what of the homes? In North Adams they are of a better class than in many textile centers. Out of 71 families, only 17 fathers were in the cotton mills, and the others ranged from the day laborer, at a daily wage of $2, through all the grades of trade, commerce and profession. Furthermore, the appearance of the home would indicate that the grade of family had a corresponding range from the good-grade family to the poor family, although the number of the latter are comparatively few.[2] In surprising contrast to the general good appearance of the home and the occupation of the parents is the fact that only one-quarter of the children had completed the grammar grades. However, we found that 38 out of 71 families, or over one-half, approved a school in which industrial training should be given, and bewailed the lack of opportunity for their children to learn a trade. Furthermore, there is no doubt that the estimate of our visitors is not an exaggeration, — that 58 of these families, or 83 per cent., could afford their children further schooling, and would do so could they hope for any practical returns in the wage-earning power of the child.

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[1] At the conclusion of this section will be found a full discussion of the wage opportunities and the influences of the cotton industry, based on the study of conditions throughout the State.

[2] There are only 11 families classed as low grade.

The woolen industry at once shows that it is of a higher grade, in that so few children are to be found under sixteen, — less than 10 per cent. of those who obtained schooling certificates. The greater permanency of employment, the less amount of shifting of the younger employees, is here connected with the higher grade of intelligence and a greater opportunity for advance, as will be seen in the study of the industry under the discussion of the city of Lowell.

Many of the children in the woolen mills are of foreign parentage, though to a less degree than in the cotton. The children seem to follow the occupation of the parent to a greater degree, and the parents are more ambitious for the child to have a trade in proportion to the improved grade of family. Thus, three-quarters of the families are either above the average of a mill family or are of the good grade.[1] Practically all of these children left school without graduating; but again we find the same approval of industrial schools, and the same ability to afford such education to their children.[2]

The largest group of families visited in North Adams is classified as miscellaneous, since comparatively few are in one industry. But this group affords most interesting contrasts. Let us consider first those who are in desirable occupations. Twenty-three of these children are to-day in good commercial positions. Only 1 of them commenced work under sixteen, and all except 2 have had part or entire high school or business college training. Ten of this miscellaneous group are at present in high-grade skilled trades; 8 of these either commenced work after sixteen, or had a partial or complete high school training. Of the few in low-grade skilled industries, — mostly manufacture of boots and shoes, — just one-half remained in school until sixteen, or could easily have done so. Twenty-six of the entire group are in miscellaneous stores, three-fourths of whom have had some high school training at least; but it is instructive to note that within two years half of them have reached $6 and half are earning from $9 to $12. It is the grammar school child that has fallen by the way. The rest of the group are in miscellaneous mills and unskilled industries, the 14 non-graduates of the grammar grades earning from $3 to $5.50 or $6, and the graduates from $6 to $10. However, 9 of the 14 could have continued in school if they had so desired. The majority of this unskilled group have "comfortable" or "high-class" homes.

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[1] By the expression "good grade" is meant a thrifty and industrious family, in a comfortable home. The weekly family income per person, exclusive of what is expended for rent, is usually more than $3.

[2] The number of homes investigated in this industry was small, — 22 in all; but 17 of these families were above the average mill family.

To sum up the situation in North Adams, the mills attract children from all grades of families, but mostly those who have not completed the grammar grades, and none who have had high school work. Their productive power to the family is from $3.50 to $7, — their maximum.

The other children who drop out of the schools before graduation not only do not enter but are not to be found after four to six years in high-grade industries or desirable commercial positions. Their chances to enter the low-grade industry are a little better, but even in the unskilled commercial life their chances to gain positions are three to one against them. And when they do, they stop at the wage with which their high school competitors begin. Similarly in the factories of unskilled grade they must yield to the graduates of the grammar grades all positions worth from $6 to $10. The fact is that the years in mill, factory, shop or store have not resulted in as advanced positions as have the years in school.[1]

But our investigation shows that these disadvantages are unnecessary; that the schools are not holding the pupils as long as the financial status of the family would permit. Almost 80 per cent. of the families could afford further training, and over 50 per cent. of the parents have expressed a desire for better opportunities. If we make the statement on the basis of individuals, 70 per cent. could attend advanced schools, if attracted or persuaded to do so.[1]

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[1] Out of 39 employed in miscellaneous industries, between the ages of seventeen and twenty-four, who were earning $8 to $15 per week, the maximum wages, 31 had been high school pupils or were graduates.

Lowell.

The city of Lowell presents an especially interesting study, since in it we have our only opportunity to understand the position of the sixteen to twenty year old youth.[2] For that reason we have visited families of every class, from every industry, by using factory, school and census lists. Almost half of the children at fourteen and fifteen are at work. This proportion is of course much greater in the later age periods, although the percentages of those employed in the various grades of industry do not change in the same ratio. Under sixteen about one-third are employed in cotton, a little more than one-quarter in wool, worsted and carpet manufacture, and one-fifth in other industries, unskilled in nature. That is, one-tenth are in low-grade skilled and high-grade skilled industries. The story repeats itself. Eighty per cent. of the children at work between fourteen and sixteen are in mills and unskilled industries, and between the ages of sixteen and twenty this percentage decreases to 70, while the skilled industries claim twice as many as before.[3] High-grade indus-

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[1] The statistics are as follows: —

Total individuals found,	257
Total families visited,	167
Total families approving opportunities for industrial training,	87
Total families who could afford such training,	132
Total individuals between fourteen and seventeen who could accept such privileges,	94
Total individuals who could not accept such privileges,	45

[2] This has been made possible by the special report of the Lowell census. For a summary of these statistics see Table No. 4.

[3] Percentages of youths in employments in Lowell: —

	At **14** and **15** (Per Cent.).	At **16** and **17** (Per Cent.).	At **18**, **19** and **20** (Per Cent.).
Mills,	59	53	50
Cotton,	31	25	27
Woolen,	28	28	23
Unskilled,	19	17	19
Low-grade skilled,	6	4	4
High-grade skilled,	4	10	11

tries are so much in the minority in this great mill center that this change in percentage is more significant than it seems. But the investigation of the homes will elucidate the situation more fully.

Since the textile industries are the most important, our first study must be of families whose children are in cotton and woolen mills. For years this city has been known as containing the most foreign and the poorest element of the cotton workers of the State, and it is only necessary to state that our investigators have confirmed the opinion. That the most thoroughly foreign element is in the cotton mills, that the better grade of foreign family will send its children into the woolen or worsted industry if possible, that the American family will not allow its children to work in the cotton mills, — follows as a result. But let us know the worst, — yet not the worst, since many foreign families in what is known as "Little Canada" must be passed by for want of mutual understanding between investigator and parents. However, most of those interviewed were foreigners. As we have seen, 448 children, of whom 405 are foreign, are employed in the cotton mills.

The returns from visiting a little less than one-quarter of these children in their 66 homes are indeed puzzling. Evidently here, as in North Adams, the child does not enter the industry because other members of his family are there, since less than one-third have older members of the family so employed, and only 12 of the parents are cotton operatives. Yet the greater part of these parents are unskilled workers, and a far greater proportion of the older members of the family are in industries of the same grade.[1]

We are not surprised, then, that the weekly wage of the children is a little less and the shifting from mill to mill greater than in other cities; that such a small proportion have graduated from the grammar school;[2] and that only 28 per cent. expressed a desire for industrial training. But we are surprised to discover that the investigator has reported that a third of these families are apparently in "comfortable" circumstances; that 71 per cent. of them could afford more education to their children; and that many of the foreigners live in neat, respectable tenements. Furthermore, the wages of the parents range from $7 to $13, — not below the average income of the working man. Is the condition so hopeless? Suppose we admit that we have reached 96 of the best class of cotton operatives. They are still below the grade in other cities. Again the problem of these people is "to find the way out," and the only way to help them to do this, because of the lower grade of foreign element in such cities as Lowell, is to establish right in their midst opportunities for industrial education of a most practical character, that they may test its value.

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[1] The proportion is 35 to 11 for parents, and 46 to 2 for older children.

[2] Only one-third remained in their first position over one year as compared with over two-thirds in North Adams; and practically all had been in one or more firms since their first employment. Only one-sixth had graduated from the grammar grade, in comparison with one-fourth in North Adams.

Our investigations in woolen and worsted in Lowell must stand for the principal work on this industry in the State.[1] As in North Adams, the families are of better grade than in the cotton industry. Especially in the larger cities do the operatives go from cotton to woolen mills whenever possible. Here, too, it is more a matter of family sequence. One-half of the 81 families visited had older members in the same industry, although but 6 were parents. The wage opportunity is also better in woolen or worsted manufacture. In Lowell the initial wage is usually $4, although sometimes less; and the average maximum of $6 to $7 is attained within two or three years, but the wage may advance to $8 or $9, especially in the hosiery and knitting mills. The shifting from woolen mill to woolen mill is great.

It is in the home, rather than in wage or stability of employment, that the better conditions are apparent; and this is hopeful, since there are almost as many woolen as cotton operatives in Lowell. A third of the parents and a greater proportion of the older children of the families are in skilled employments, with wages from $10 to $20. Our arbitrary classification of the families places almost half in the good grade, — an estimate which is borne out by the fact that one-third of the children graduated from the grammar grade, and

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[1] This is based on visits to 81 families, in which were 142 children employed in the mills, — over one-third of the total under sixteen employed in woolen mills.

3 had some high school training. For some reason the proportion of families who apparently could afford continued training for the children is but 62 per cent., — less than among the cotton operatives; but this percentage advances to 73 in Holyoke and 80 in North Adams.

Among the miscellaneous employments in Lowell the grade of family is better than of any as yet considered. There are about twice as many parents and older children in skilled as in unskilled labor; the family wage is greater; and the proportion of those who could have continued in school is greater, but only one-fifth are graduates of the grammar grades, as compared with one-third of those in woolen. The schools have not held the children of this higher grade of family any better than even among cotton operatives. In this instance the child is determined to go to work, the parent will not have him in the mill, and hence he enters store, shop or factory, in which there is absolutely no chance for advancement.[1]

There are two advanced industries which especially attract the better class of children, — the boot and shoe factories and the machine shops. Since these will be fully discussed in connection with the shoe centers of Lynn and Brockton and the machine centers of Worcester, Springfield, Lynn and Cambridge, it remains only to note the position of the child. In the first place, how and why does the child get into the better grade of industry in a city in which the mill is at his very door? The reasons are apparent. More of the parents are in the same industry, and a much greater percentage of parents and children are in skilled industries, especially in machinery.[2] Also, the income of the parents is proportionately greater, — ranging from $7 to $14 and from $10 to $25 or $30, according to the grade of employment. Then, too, the grade of family is decidedly better among the shoe operatives, and very good in the families of the machine shops. The wages in shoe factories seem to be in advance of those in other cities. However, in machinery it is astonishing to find that only 6 of those classed as apprentices by the census, who were visited, are really apprentices learning the entire business, and that the others are rather helpers, learning to operate one machine. The higher initial wage and the lower maximum wage, as well as the statements of employees, prove this fact. Thus it is that these boot and shoe and machinery operatives are earning during the first four years from $5 to $10, with a few advancing in two to four years to $12 or $13. Is it, then, the son of a well-to-do family only who is to have a chance to enter the desirable industry? Must the boy of the poorer family suffer? But what of the school conditions? The proportion of graduates from the grammar grades is about the same in the shoe industry as in the woolen, and likewise the percentage of children who could afford industrial training is the same. In machinery both percentages increase; but the high school boy is apparently not a factor, although many do not enter machinery until after sixteen years of age.

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[1] Of the 86 individuals, 6 are in skilled industries.

[2] Thus more than one-quarter of the parents are in the same industry, and almost two-thirds of the children and parents are employed in skilled industries.

New Bedford.

The city of New Bedford presents a unique condition. Practically all of the children who go to work enter the cotton industry, and the same may be said of Fall River. In the former, however, there is a high-grade industry which attracts many of the children, commencing work after sixteen, or from the mills at sixteen. Thus many of the younger children in the cotton mills have older brothers or sisters in the glass and silverware manufactory. In Fall River there is no such industry, and the problem is entirely that of the cotton operative. New Bedford cotton operatives are largely Portuguese, doing a high grade of work. These people are a thrifty people, bringing with them the predisposition to a farming life, and a desire to own their own homes. Consequently, there are fewer tenement and more individual homes, although not as neat in appearance as the homes of the French Canadians. Roughly speaking, conditions in New Bedford parallel those in Lowell, although more stable in character, while in Taunton and in the Holyoke thread industry conditions are similar to those of North Adams, the latter being a little higher in grade.[1]

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[1] For the data on which these comparisons are made, see tables Nos. 8 and 9.

Summary.

Let us sum up the value of the years from fourteen to sixteen for the child at work in the textile centers. This will mean a summary of the conditions of children in the cotton, woolen, silk and paper industries, since the number in shoes, machinery and miscellaneous employments is so comparatively small.

Universally, five-sixths of the children in the cotton mills have not graduated from the grammar schools, and a very large proportion have not completed the seventh grade, while practically none of the children have had high school training.[1] All of these children are by no means from the poorest homes; in fact, there are twice as many in what we have classed as good-grade families [2] as there are in the second grade. Neither is the appreciation of education of a low grade. Forty per cent. of these families have shown a decided interest in a school which would give their children wage-earning powers, and have declared they wanted their children to remain in school; and, what is more tragic, 66 per cent. of them could have kept them there.

It is the dissatisfaction on the part of the child which takes him from school, and ignorance on the part of the parent which permits him to enter the mill. Thirty-seven per cent. of parents and older children are in unskilled employments, but an average of less than one-sixth of the parents are cotton operatives. The parent does not know where to find an occupation for his child. Then, too, the better occupation either will not receive the young child at all, or wants him with more schooling, or offers such a low initial wage that both child and parent turn to the mill, with its greater present wage opportunities.

So much for the reasons why the child enters the mill.

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[1] This summary is based on the study of 617 individuals, almost all of whom entered the mills under sixteen, and 343 families. Only those families are included which have not been reported from any other industry, so as not to give false impressions in the final summary.

[2] That is, families apparently in comfortable circumstances, tidy, thrifty and intelligent in appearance, with an average income, outside of rents, of $2.50 per member of family, including all children, large and small.

What is the result? In the first place, he stays there universally. He may, and especially in Lowell he does, shift from mill to mill. In the second place, the wage offered, or possible to reach in two years, is higher than in almost any other industry. Thus the medium average wage of $7 to $8 and sometimes $9 to $10 is reached within two years by two-thirds of those under consideration, while only a little over one-third of those employed between three and four years reach the higher wage.[1] Two years may, and four years will, bring the average maximum wage. But it is important to note how steadily the proportion of those commencing work over sixteen years of age increases with the advanced wages; and, although the child may bring into the home $3 to $6 per week, his older brother, commencing at sixteen, will overtake him in less than two years.

That neither power nor advantage is gained by entering the industry at an early age; that the child who does enter closes behind him the door to progress to a fair living wage; that that child associates himself with our most undesirable population; that the work performed by the children is passing gradually to poorer and poorer classes of foreigners; that industrial education or education of any kind will mean that the children will not enter the industry, — are facts which the State must face. The State should not insist on keeping all of its children in ignorance to support industries in which industrial education is of little value. Employers, as is shown below, are not opposed to the education of the children. Wherever possible, they are rapidly securing older employees.

But no one can visit such a school as the Lowell Textile School without appreciating the dignity of textile industries,

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[1] Wages of fourteen to twenty year old cotton operatives (the numbers in parentheses indicate those commencing work after sixteen years of age): —

WAGES.	2 Years or Less.	3 to 4 Years.
$5 and under,	109 (7)	12
$5 to $8 inclusive,	161 (47)	102 (17)
$8 to $10,	8 (5)	61 (26)

nor without feeling that it is not necessary to build up the industry on the sacrificed lives of the children. Industrial education will not permit the child to enter the mill and remain at one process until he becomes too large to be content with $4 a week, or until he "insists uncomfortably on promotion," as one employer expressed it. But it will make him sufficiently expert so that our cloths can compete with the foreign market, leaving the poorer and cheaper materials to be made in the south, and it will so dignify the industry that it may become an industry for Americans. The more educated the man, the more willing he is to do a certain amount of drudgery if he sees anything but drudgery ahead. Intelligent labor may force an intelligent wage, but it will also turn out a high-priced product. It is the child's work only which the employer declares cannot be improved by higher intelligence or more education. He universally clamors for more intelligence in his older and more advanced workmen.

Let us see what the testimony of employers is. Out of 23 firms, all except one take children at fourteen, but 9 declare they do not want them until they are sixteen to eighteen years of age, and 3 place the age at eighteen to twenty. Thirteen of these firms declare that the children are "irresponsible," "lazy," or physically undeveloped. But the most illuminating fact is that, in a number of mills where the employer has argued against industrial training for children as useless in his business, the foreman has proved that no children under sixteen were employed.

It is a curious fact that in every city visited outside of the great textile cities, such as Attleborough, Great Barrington, some of the Taunton mills, Fitchburg and Worcester, but very few children are employed. It is surprising to find 18 firms urging the advantages to the industry of more education for the child, and 10 declaring for industrial training in general, though not as applied to industry. Evidently the industry can thrive without child labor, and thrive better with educated labor.

The discussion of the woolen industry above, in connection with Lowell, has pointed out the better grade of family and child in that industry.[1] The opportunities for nicer and cleaner work, if not for much higher wages, and the greater range of the industry, as seen in the manufacture of carpets, in hosiery and knitting mills and in fine worsted goods, places it on a higher plane. The result is that the employer can get the older workman, and he takes him. Employers are not only declaring that they want the sixteen to eighteen year old child, but they are more and more refusing to take the younger child. This is also seen in the small proportion of children to the number employed. Thus, only 6 out of 25 firms express themselves as wanting children under sixteen, and almost half have none or barely a dozen employed. The child who is now employed in woolen manufacture under sixteen must soon enter cotton mills or department stores.

The other textile industry, silk, is in much the position of the woolen industry, in that very few children under sixteen are admitted. Similarly, the manufacture of paper is generally so clean and the work so agreeable and simple that the employer easily secures the girl over sixteen. Since these industries offer opportunities for advancement to so few, and employ so few, we shall omit them from the discussion, as concerning neither what the years between fourteen and sixteen mean to the child, or might mean. The interested reader is referred to the tables for the data gathered from home and factory concerning these industries.

COMMERCIAL CENTERS.

Two thousand seven hundred and ninety-four children have been looked up in the 4 commercial centers of the State, —

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[1] Wages of children (the numbers in parentheses indicate those commencing work over sixteen years of age): —

WAGES.	Under 2 Years.	3 to 4 Years.
$5 and under,	116 (5)	6 (1)
$5 to $8 inclusive,	68 (10)	30 (7)
$8 to $10,	4 (3)	23 (7)

Boston, Cambridge, Worcester and Springfield. In the first 2 alone 1,821 were visited.[1] These represent also the machine centers of the State. In these cities we come upon industries outside of the mills in which children under sixteen are employed in great numbers, and are also brought face to face with the biggest problem of all, — that is juvenile employments.

What these industries are may be seen by referring to the reports on the age and schooling certificates.[2] Thus in Boston 609 were granted for department stores, 234 for messengers and errand boys, 111 for confectionery and crackers, and 232 for a shoe factory. When we see that this means 1,185 out of 1,510 considered, we gain a conception of where our children are to be found. In Worcester the conditions change slightly, since 143 have entered department stores, but a larger proportion are in the low-grade skilled industries. Addresses of children at work in Cambridge, obtained from the census, show the children to be in department stores, candy factories, rubber factories, and sundry miscellaneous employments. Springfield offers similar conditions. But this expresses the situation comparatively only, since interviews with employers and the Cambridge census have revealed that fully 1,165 are in department stores in Boston, Springfield and Cambridge alone; that 288 are in confectionery in these cities; and 248 are messengers and errand boys.

With these general conditions before us, we have undertaken to find out their effects; and, since there is danger of overlooking many industries, or of studying one class of children only, or of confining our attention to one district or type of locality in cities as large and extended as these, we have used several methods of obtaining addresses. The age and schooling certificates have been used as a basis in Boston and Springfield, lists of young employees from firms in Boston and Worcester, names of children leaving school at fourteen and fifteen in Boston, and addresses from the census in Cambridge. In the latter city only the native-born were considered, but all of the congested and poorer districts were visited. In

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[1] In Worcester 727 children were investigated, and in Springfield 246.

[2] See Table No. 3.

Boston the ultra-foreign districts of the North End were omitted, although many foreign families were interviewed, as also in other sections of the city.

Department stores present the most perplexing problem. Regarding these there is a mingled feeling on the part of the parent. He is influenced against his better judgment to permit the child to enter the store, because of his desire to find work for his child, and the difficulty of gaining an opening for him. Then, too, he is influenced by the fact that mercantile pursuits are considered "nicer work," and have greater dignity, combined with the desire of the child to have contact with the larger world; that is, to be where things of interest are occurring, and where pretty things are to be seen. But it is significant that many mothers not only deprecate the situation and tell of the evils which have resulted, but are taking every precaution to keep their girls from becoming cash girls, and are making earnest efforts to find other work for them.

But let the investigation tell its own story. Three hundred and fourteen cash and bundle children have been looked up in Boston and Cambridge, and 54 in Springfield and Worcester, representing in all 253 families. It is unnecessary to state that these children have not entered this occupation because of family connection. It will be shown hereafter that it cannot be because of opportunities for advancement. It is not so much chance. It is because it is the easiest and often the only way to find employment. "It is the only thing to do," is the constant declaration of the parent, dissatisfied with wage, with the influence upon character, and with the lack of opportunities.

A child may enter a department store at a weekly wage of $2 in the poorer stores, or $2.50 or $3 in the better stores. The average initial wage for the girl at fourteen or fifteen is $2.50 in Boston, but a little higher in Springfield and a little lower in Worcester. The average advance by the time the girl has reached seventeen years of age is $3.50, at eighteen $4, and at nineteen, $4.50. However, the advance in wages varies from store to store, and it is not unusual for the girl of nineteen to twenty-two to be earning $5 and $6. Thus in Boston and Cambridge only 16 out of 70 girls between nineteen and twenty-four, whose wages are known, were earning over $6, and only 15 more were earning $6; that is, over half had an income of less than $6. The average in the smaller cities may run higher, but the data are too few to determine. The small number having had some high school training are by no means universally advanced, as only 3 out of 13 of these were earning over $6. Furthermore, the girl entering at a later age seems to have gained but little if any advantage.[1]

These are wages that cannot be considered a respectable living wage even for the eighteen to twenty year old girl. Consider the girl under eighteen earning $3.50 to $4 as living at home, and hence able to live without other means of support. What of the twenty-year-old woman? Can she meet cost of car fares, dentist's bills, clothing, let alone room and board, from her legitimate income alone? Is it surprising that the stories heard in house after house are current?

But fortunately the army of cash girls, at least 1,000 strong in Boston, according to reports from 10 department stores, is a shifting one. Out of the 368 children studied in these commercial centers, 43 per cent. have been in two or more employments since beginning work, and twenty-two per cent. have been in three firms or more; or, stating the matter differently, one-third were in the first firm less than six months. Perhaps the most telling evidence of the instability of the child as a cash girl comes from one of our largest firms, which records that 580 cash and bundle girls are taken on each year to fill 200 positions. A study of what happens to these girls is most important. That out of 103 girls 72 finally entered factories of low grade, or unskilled work, 8 went into offices, and 23 into high-grade work, is evidence of their fate. But that their initial wages in the new industry were $3 to $4 shows the uselessness of the years in the store. To have commenced in the better employment at sixteen would doubtless have meant better opportunity and better wages within a short time.

Not only is there a poor wage opportunity and evil effects from instability, but there is such slight chance to advance. It is not even the avowed policy of the majority of employers to advance the cash girl. She is either too immature and irresponsible, or she is too small physically, or she is of too poor class, or has too low education. But most of all she is inexperienced as a salesgirl. She must go to "some smaller or poorer store" to get her training and experience.[1] She must do as does her brother, — pick up what training she can get, and even then her outlook is extremely meagre. Is it that the young girl is taking the place of a mechanical cash system, and that the older one is more desirous of the mercantile than of the factory life, that she gives her services for less pay than in any other industry except perhaps in confectionery? Or is the girl's productive power so little in this industry, even at the age of eighteen or twenty, that she cannot command more?

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[1] For a statement of the average wages and for a classification by ages, see tables Nos. 9 and 10.

Are these children forced to go to work? Do they come from poor and unappreciative families? Why are they content? Seventy per cent. of the members of these families are in unskilled industries, while the grade of family, as here defined, is poorer than in almost any industry in Boston,[2] as far as their intelligence is concerned. In the interior cities about half of the families are a better grade. But the proportion of grammar school graduates is about 40 per cent. in the larger centers, or 36 per cent. of all considered, thus running higher than in many other industries, while but 27 of the children considered have attended a high school. Furthermore, the ability of the family to provide further training is expressed by 85 per cent. of 174 families, while almost 50 per cent. expressed a desire to have their children in a skilled trade. These families have had the opportunity to see the evils of the juvenile employment. Evidently the parents' ambition for the child is seen in the larger degree of education and in the greater desire to have such opportunities, combined with an ability to secure them. It is apparently usually a matter of not knowing what else to do, and a desire to be in a higher class of occupation. The grade of family is low, the members of the family are in unskilled occupations; and of 108 families whose income is known, 23 have less than $2, 24 have $2, and 13, $2.50 per capita, after the rent is deducted, while 48 have $3 to $6 per capita income. It is surprising to see that in 3 large families having an income of $5 to $6 per individual the children commenced work at fourteen.

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[1] In four large stores, less than 5 per cent. of the cash and bundle girls are promoted to salesgirls.

[2] Good grade, 88; middle grade, 101; poor grade, 55.

The other great juvenile industry is one in which boys are to be found, — messengers and errand boys. The larger companies do not want the boy under sixteen, although he is to be found there oftentimes. The errand boy in the office is usually in a way to advance if he is bright, otherwise he falls out at short notice. In other places it is but a drifting position. The future for the boy is uncertain, but in the messenger service the superintendents of two large companies state that many of the boys drift into positions as policemen, street car conductors, janitors in public buildings, and other similar unskilled occupations. That the influence on the morals is bad is difficult to prove, except the admission that so great an amount of waste time is dangerous. The precaution to take "no orphans" and even no boys without a father is evidence of the difficulty of discipline. On the average, messenger boys receive $3.50 to $4, and rest content with $5 or $6 at seventeen or eighteen, or pass into some other industry. Here over half of the other members of families are in unskilled labor, although the grade of family is certainly higher than in the juvenile industry for girls,[1] while the proportion of grammar graduates is smaller (only 25 per cent.), a fact easily accounted for by the sex; but the percentage of those able to give the child further training is less, that is, 80 per cent., and the attitude is not as favorable as among families from department stores. The income of the families, exclusive of the rent, is higher than among the families of cash girls, since 44 out of 75 have a per capita income of at least $2.50, while in 37 families it exceeds $3.[2]

It is certainly encouraging to know that these two juvenile employments are not necessary to the great majority of the families, if a "way out" can be discovered.

Three industries in which girls are to be found in large numbers, though comparatively few under sixteen, are confectionery, rubber and paper. The conditions under which girls work in these factories are not to be compared, since the latter is so clean that not only is the older girl there, but by far the better class of girls. The candy factories attract mainly the poorest element, — largely Italian in Boston. When the unclean conditions in many factories are considered, this is easily understood. That some of the confectionery establishments should sell the scrapings from rough wooden floors where several hundred Italians are working to cheap candy factories causes horror, and a query why the pure food agitation should not concern itself with cheap confectionery is pertinent. The poorer factories are dirty enough in themselves to exclude the average working girl. The wage is correspondingly low, ranging from $3 at fourteen years of age to $4.50 at seventeen, and $5.50 at eighteen, while those girls considered from eighteen to twenty-two do not pass above $6. Again it is a question of a living wage. But, since the family is so much lower and so foreign, it does not force itself on our attention as does the ever-present cash and sales girl. The great proportion of unskilled labor in the family, the preponderance of the medium and low grade families, and the large number of families with a per capita income of $2 or less, show the home conditions.[1] Only 14 out of 140 girls are grammar graduates, and the number interested in further education, as well as those able to continue, is very small.

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[1] Unskilled, 143; skilled, 77; good grade, 50; medium grade, 52; low grade, 14.

[2] Ten families have an income of $1 to $1.75; 24, $2; 9, $2.50; 24, $3; 3, $3.50; 15, $4; 2, $4.50; 3, $5; 1, $6.

A study of food-product factories shows very different conditions. The girls are not received until they are sixteen, the working conditions are clean, although the average wage is $5 and $6. In one firm, where 102 individuals were investigated, the employees live in a suburban town and come from better homes, doubtless making the wage bearable, although hardly a living income for the twenty-year-old woman. Almost all of these families average a per capita weekly income of $3 to $4, while the percentage of those able to secure greater educational advantages is very high, and over one-half are grammar school graduates. Together with department stores, the candy factories are most injurious in their effects. The advantage of the former is that the girls must get out of them within a few years.

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[1] Unskilled, 136; skilled, 58; good grade, 68; medium grade, 79; low grade, 13. Per capita, $2 or less, 22 out of 42, 8, $2.50; 6, $3.

The rubber operatives in Cambridge, of whom 75 were studied, are in work compelling a certain amount of skilled manual labor, and with the prospect of a higher possible wage of $9. The work is not congenial to the better class, since many foreigners are employed, and there is a strong feeling against it; therefore the grade of family is below the average, and the employees have but little education, although the ability and the predisposition to industrial training stands about 3 to 1.[1]

We have in Cambridge, Springfield and Worcester two remaining groups, — the one unskilled, the other skilled. But since they represent a variety of industry, in none of which large numbers of young people are employed, the reader is referred to the tables, in which appear the data. Since they represent the industrial history of 916 individuals, they should not be neglected, and therefore they are included in the summary. Suffice it to say that they reiterate what has been found, namely, that in the unskilled industry the older members of the family are usually in similar grade occupations; that the medium grade of family predominates in the unskilled group; that, on the other hand, the proportion of grammar graduates stands at hardly a third of the whole in each group; that the per cent. of those who can afford advanced training remains at about 72 per cent. and the interest in such training at 10 per cent. more, although the miscellaneous and heavy work comes down to 10 per cent.[2] A discussion of the skilled group, including machinery for boys, and millinery, dressmaking, and machine operating for girls, will be found in the following sections on " Boys " and on " Girls."

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[1] Of 75 individuals visited, 14 have graduated from the grammar grade, and 2 have attended the high school. Of 27 families, 3 have less than $2 weekly income; 8 have $2; 3, $2.50; 7, $3; 3, $3.50; 2, $4; 1, $5.

[2] These industries are included in tables Nos. 7 and 8, under the following; various factories, unskilled: the same, skilled; paper, wire and organ in Worcester; laundries, heavy work and miscellaneous for Springfield and Worcester.

SHOE AND JEWELRY CENTERS.

The three centers investigated, Brockton, Lynn and Attleborough, are typical of many cities of the State where a single industry predominates. These have been classed as low-grade skilled industries, but it must be remembered that there are skilled occupations in each. Furthermore, these cities stand as unique, since children under sixteen are not admitted in large numbers to the important factories. Consequently, comparatively few certificates are granted by the schools. There may be one or two office boys under sixteen in each factory, and a few children as operatives in each employment. It is rather a question of what the boy cannot do, than of what he can do. Therefore he remains in school. That the families are in the same industry, that the proportion of skilled workers in the family is greater, that the grade of family is high, that the percentage of those families which could and would patronize industrial schools is very large, and that the labor is stable, is to be expected.[1] But where are the graduates and high school children? The record in this respect is not better than in other cities, although better in Lynn than in Brockton.[2]

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[1] Family conditions of children employed: —

	In Shoe Factories in Lynn.	In Shoe Factories in Brockton.	In Shoe Factories in Boston.	In Jewelry Factories in Attleborough.
Family skilled,	130	108	28	70
Family unskilled,	62	108	56	26
Good grade,	113	83	24	60
Medium grade,	86	62	45	22
Low grade,	50	22	12	14

In Lynn, out of 95 families whose income is known, 9 have under $2: 16 have $2; 17, $2.50: 21, $3; 4, $3.50; 18, $4: 1, $4.50; 5, $5: 3, $6.

In Brockton, out of 54 families, 4 have less than $2; 5 have $2.50: 7, $3: 1, $3.50; 14, $4; 11, $5; 7, $6; 1, $7.

In Boston, out of 24 families, 1 has less than $2; 4 have $2; 8, $2.50; 5, $3; 1, $3.50; 2, $4; 1, $4.50; 1, $5; 1, $6.

[2] This is proved by the following table: —

	Number considered.	Number of Grammar Graduates.	Number having attended High School.
Boston,	103	29	3
Brockton,	179	53	7
Lynn,	283	91	23

Since no shoe firm teaches the child except in Boston, and since the laborer must have had, according to the union, six months' training on any machine, the boy must leave home to work, unless he is sufficiently fortunate to have a father, an uncle or an "adopted" relative who will teach him his trade. The shoe schools as they now exist are universally condemned as purely money-making schemes. What is the boy to do? Where is the skilled labor to come from? He will be able to take training if he can get it at home; otherwise, he must go to other cities to learn his trade. One shoe firm in Boston teaches the children at fourteen, and a study of conditions in that city is most important. The grade of family is below the average, although the school percentage is not lower than in other shoe centers. On the whole, the children are permanent in position, and content with the fact that they are learning a trade. Many children in Boston are eager to take this opportunity, while a large percentage could continue in school if they so desired.

The conditions in Attleborough so nearly parallel those in Brockton that discussion is unnecessary, except to note that the opportunities for a paying trade do not equal those of other cities. The work for girls on the smaller parts is so specialized that it does not look toward advance to any extent, although there are great possibilities for the few in design and some other kinds of skilled work.[1]

The attitude toward industrial education is almost that of a demand for it, and local sentiment has expressed itself strongly in these towns. The employer feels the need for better-trained operatives to maintain the standard of work, or to advance the quality, as in silverware manufacture; while the families are feeling keenly the lack of opportunities for their children to become prepared for the great industries at their doors.

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[1] Out of 85, 28 are grammar graduates, 5 are high school students. In 30 families whose weekly income is known 3 have $2; 3, $2.50; 5, $3; 3, $3.50; 6, $4; 2, $4.50; 7, $5 or more.

IV. WHAT THE VALUE OF THE YEARS FROM FOURTEEN TO SIXTEEN MIGHT BE TO BOYS.

In the preceding discussion we have studied the work which children enter between fourteen and sixteen, and its effects. It remains to discover what these years might have meant if they could have been spent in desirable occupations or in school.

The fourteen-year-old child enters unskilled industries, and remains there. The sixteen-year-old child more often enters the higher-grade work, although he is sometimes found in the unskilled industries. The desirable industries which are open to the fourteen to sixteen year old boy, according to the report of employers, are extremely few in number; thus, practically all employers in such industries declare they do not want the boy before he is sixteen, while the majority place the age at eighteen, and the numbers actually employed are very few. That some firms do take the younger boys is stated. While the proportion of the number of boys under sixteen reported upon may seem large, it is due to the fact that the lists were largely taken from scattered industries and from a few firms in which the teaching or apprenticeship system is in vogue. Printing and publishing, the manufacture of combs, horn and celluloid, and machinery, are practically all of the skilled industries which take the younger boy.

A study of 412 boys and 254 families in machinery will give us a fair basis for judging of the home conditions of the children who start under better auspices. One hundred and twenty-five of these boys started over sixteen, and 148, or one-third, had either parents or older members of the family in the same industry. This is a notable contrast with the lower industries. It is universally true that the father with a good trade wants his boy in the same occupation. The families are of course high class, there being fully twice as many whose parents and other members are in skilled as in unskilled work.

Again we are surprised at the small proportion that are grammar graduates, less than one-third, and at the small representation of high school students, but 44 in all, or one-tenth of the total number. The number of families reported able to afford industrial training is not as great as might be expected, since it does not exceed 70 per cent.; but the percentage of those approving the principle is almost as great. The stability is of course high, 63 per cent. having been in one firm since the first employment, except in Lowell, where the shifting is twice as great.

Turning to the reports on printing and publishing, we find one-quarter of the parents or older members of the family are in the same industry. The excess of high-grade families is not so great, nor is the percentage representing stability, although it is above the low-grade skilled industries. The per cent. of approval of industrial education is high, — 83 per cent., — and the ability to afford is similarly good, — 73 per cent. Almost one-half are grammar graduates, but there are but 10 high school representatives. The wage opportunities will be better studied under the discussion of apprenticeships.

We find the grade of family high for these two industries, but we do not find the educational preparation of the children proportionally as great. Although our investigations have considered only scattering individuals in the other high-grade industries, we are impressed again and again with the slight educational preparation of the boys.[1] The attitude of employers is extremely illuminating. Considering all of the high-grade skilled industries, 70 out of 114 employers declared for special trade training, and 68 for general industrial training. Furthermore, their opinion as to the value of the child in the industry is especially important. Only 15 want the child under sixteen, and 19 think him of any worth.

The question which concerns us most in connection with the study of the highly skilled industry is that of apprenticeships. We are using the term "apprentice" to refer to that relation between employer and employee by which the firm obligates itself to teach the boy all of the processes involved. This obligation may be by oral or written contract. The latter is called an indenture, and is almost extinct in this State.[2] It must be noted that many of these industries and many firms in these industries do not take apprentices at all, or very few; and that, although they employ younger boys, they do not take them as apprentices, and do not pretend to.[1] The boy goes on as "helper," learns one process, and there remains. Returns from Lowell have proved that, out of 115 boys employed as machinists, 24 are called apprentices by the census, but really only 6 were learning the trade, and with none of these was there any written agreement.[2] We must, then, remember that most of the younger employees in the large firms of high-grade skilled industries are not learning the trade, while in the small establishments the boy picks up his trade more easily. In the machine shops 32 out of 85 of the firms visited take apprentices, and in the building trades 8 out of 23. In the latter trades indentures have been abolished for the past twenty-five years, while in the former but 4 firms issue such binding documents.[3] An appended study will show the condition in the United States in 1902, from which it appears that the system in Massachusetts is more on the decline than in other parts of the United States.

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[1] Including machinery, ship building, glass and silverware manufacture, and printing and publishing, statistics are as follows: number considered, 681; number of grammar graduates, 226; number of high school students, 57. Number having a weekly income per person, exclusive of expenditure for rent: 17, less than $2; 24, $2; 35, $2.50; 44, $3; 20, $3.50; 30, $4; 11, $4.50; 17, $5; 13, $6; 9, $7.

[2] There are 6 firms only which have come to our notice which still employ the indenture, in addition to 4 which have an agreement through the North End Union Printing School.

Result of Investigation concerning Apprentices, by E. H. Parks, of Browne & Sharpe Manufacturing Company, Providence, R. I.

[Cassier's Magazine, Vol. 23, page 199.]

CHARACTER OF MANUFACTURE.	Number of Factories studied.	Number taking Apprentices for Four Years.	Number taking Apprentices for Three Years.	Number taking Apprentices but with no System.	Apprenticeship System abandoned.	Having no Agreement.	Indenture.	Information Incomplete.	Pay Bonus.	Require Deposit.
Machine tools,	41	25	8	4	2	2	21	6	18	5
Engines of all kinds and pumps,	37	21	4	6	1	3.	17	2	13	1
Electrical apparatus and miscellaneous,	34	10	5	7	3	7	11	2	9	1

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[1] Thirty-two firms in mechanical trades take apprentices, but 4 only have employees under sixteen years of age.

[2] This fact, generally stated by the employees, was found to be true from the interview with the parents, showing that they were not learning the entire process. The high wage paid also proved the assertion.

[3] These are the General Electric, the Stanley Electric and the Norton Grinding Company, and F. E. Reed of Worcester.

Furthermore, a report of the committee on apprenticeships of the International Association of Master House Painters and Decorators of the United States and Canada shows how few apprentices are being employed in that industry. That committee has attempted to encourage the system by granting certificates, but the returns quoted below show how ineffectual has been the attempt.[1]

During the winter Mr. Wall, the chairman of this committee, sent letters to every local association, asking how many of the members took apprentices. Only 10 replies were received, giving expression to the fact that in most of these centers the painters employed 1 apprentice.

The plumbers in their national convention recommended to the local associations that they establish night schools of plumbing, to supply the theory necessary to a complete knowledge of the trade, as the day's work is at present seldom carried on directly under the master plumber.

The actual number of apprentices employed in Massachusetts, that is, of boys who are being given a course of instruction, is not as great as might be supposed. This is seen from the study of a few firms, as in the following table: —

Proportion of Apprentices to Employees.

Trades.	Proportion.
Machinery, 1 firm,	1 to 8.
Machinery, 1 firm,	10 to 250.
Machinery, 1 firm,	15 to 40.
Electrical apparatus, 1 firm,	200 to 7,500.
Tools,	2 to 125.
Needles,	6 to 170.
Matches,	12 to 3,600.
Lithographing,	Limited by union.
Printing,	Limited by union.
Painters,	1 to 10, limited by union.

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[1] Certification of apprentices: —

Total number of certificates filed during the five years,	178
Number of certificates granted to Feb. 8, 1906,	87
Number of certificates cancelled,	9
Number of applications for certificates now on file,	39
Number of apprenticeship blanks marked "No Apprentices,"	43
Number of certificates granted since the close of the last convention,	25
Number of apprentices registered this year,	30

The age at which the apprentices are received is sixteen or over in almost all cases. Reports from the firms give 2 firms only taking the boy at fourteen years of age; 2 at sixteen; 2 at seventeen; 4 at eighteen; 1 at twenty; and 1 at twenty-one.

Electricians and machinists pay $4, $5 and $6 during the three years of apprenticeship. Painting, lithographing and most of the building trades pay $6, $7, $8 for the three years. Machinists pay a lower wage, and 1 printing firm gives $100 at the end of the term.

Below is a study of 215 so-called apprentices, found in visiting the families. It may be that many of these are really "helpers," but the family either declared that the boy was being taught, or the low wage seemed to indicate the fact. The fact that many started at fifteen may be accounted for by the custom of taking a few errand boys and promoting them, or by their being in small concerns.

It is surprising to note that many of the families are of a medium grade only, that 26 individuals were high school pupils, and that machinists gained their opportunities to enter their trade through their father or a friend. The wage returns are also of interest, and are here given: —

Weekly Wages of Apprentices.

	Nothing.	$2.	$3.	$4.	$5.	$6.	$7.	$8.	$9.	$10.	$12.
Glass blowers: —											
First year,	–	–	6	14	5	–	–	–	–	–	–
Second year,	–	–	–	–	3	5	1	–	–	–	–
Third year, .	–	–	–	–	1	2	3	–	–	–	1
Fourth year,	–	–	–	–	–	–	–	–	1	2	–
Compositors: —											
First year,	–	–	4	5	1	–	–	–	–	–	–
Second year,	–	–	–	–	1	–	1	2	1	1	–
Third year,	–	–	–	–	–	2	–	–	1	1	–
Fourth year,	–	–	–	–	–	–	–	2	1	1	–
Printers: —											
First year, .	–	–	11	9	2	1	–	–	–	–	–
Second year,	–	–	–	1	–	2	2	–	–	1	–
Third year, .	–	–	–	–	1	–	–	2	–	1	–
Fourth year,	–	–	–	–	–	–	–	–	–	–	–
Miscellaneous: —											
First year, .	–	–	4	15	–	–	–	–	–	–	–
Second year,	–	–	–	–	–	–	–	–	8	–	7
Third year, .	–	–	–	–	–	–	–	–	–	–	4
Fourth year,	–	–	–	–	–	–	–	–	–	–	–
Plumbers: —											
First year, .	–	–	–	–	1	7	–	–	–	–	–
Second year,	–	–	–	–	–	–	–	–	–	–	–
Third year,	–	–	–	–	–	–	1	–	7	–	–
Fourth year,	–	–	–	–	–	–	–	–	–	–	–
Painters: —											
First year, .	–	–	4	6	–	–	–	–	–	–	–
Second year,	–	–	–	–	–	–	–	–	–	–	–
Third year,	–	–	–	–	–	–	–	–	6	4	–
Fourth year,	–	–	–	–	–	–	–	–	–	–	–
Dressmakers: —											
First year,	4	4	10	1	–	4	–	–	–	–	–
Second year,	–	–	1	2	1	4	2	–	–	–	–
Third year, .	–	–	–	2	–	1	–	–	–	–	–
Fourth year,	–	–	–	–	2	–	1	1	1	2	–
Milliners: —											
First year, .	–	3	6	2	2	–	–	–	–	–	–
Second year,	–	–	–	1	1	1	–	–	–	–	–
Third year, .	–	–	–	–	2	–	1	2	–	1	–
Fourth year,	–	–	–	–	–	–	–	–	–	–	–

Apprenticeship Conditions in Massachusetts, based on the Study through Visits to Families.

	Numbers of —								
	Machinists.	Compositors.	Printers.	Plumbers.	Painters.	Glass Cutters and Blowers.	Milliners.	Dressmakers.	Miscellaneous Apprentices.[1]
Total number of apprentices considered.	42	14	32	8	9	31	15	31	33
Apprenticeship the first employment.	40	11	25	3	4	22	3	22	–
Employments engaged in before becoming apprentices: —									
Unskilled, . . .	28	3	7	2	5	9	12	9	–
Skilled, ...	–	–	–	3	–	5	–	–	–
Time in these employments: —									
Six months, . .	15	4	2	1	–	4	2	2	
One year, . . .	9	–	–	1	2	1	1	4	–
Two years, . . .	11	1	25	3	3	3	–	3	–
Wages in these employments: —									
$3, ...	2	1	1	–	1	–	2	5	–
$5, ...	18	2	3	2	2	4	1	3	–
$8, ...	8	–	–	1	–	2	–	1	–
Grade of schooling: —									
High school, . .	10	3	–	3	–	3	1	3	4
Grammar grade, . .	23	9	10	2	3	6	7	10	12
Eighth and ninth grades,	27	3	13	3	3	5	5	12	10
Seventh grade, . .	11	3	3	–	3	6	3	6	11
Age of apprentices: —									
Fourteen years, . .	11	6	2	2	–	3	1	5	6
Fifteen years, . .	28	4	10	3	4	9	10	13	13
Sixteen years, . .	21	3	7	2	3	9	3	6	8
Seventeen + years, .	14	6	3	1	2	8	2	7	6
Grade of family: —									
Good-grade family, .	56	9	14	7	2	19	9	10	9
Medium-grade family, .	17	6	10	1	6	8	7	16	15
Low-grade family, .	–	–	–	–	–	–	–	–	3
Opportunity for apprenticeship obtained through: —									
Friend, ...	8	–	–	–	–	8	–	–	–
Father, ...	24	–	–	–	–	7	–	–	–
Self, ...	–	–	–	–	–	3	–	–	–

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[1] Includes lithographing, silver plating, barbers, carpenters, plasterers, blacksmiths, roofers and stone cutters.

The skilled industries are sometimes recruited from the lesser industries of the same grade, such as piano polishers from cabinet makers. Thus, when the simpler processes of one industry lead to another, the bright and capable boy finds his way to the highest industry.

There are other ways of recruiting the skilled industries. The General Electric Company has an apprenticeship school,[1] there are a few firms of the second grade which systematically teach their employees, as in the case of one large shoe factory, and there are special schools requiring a high fee for horology. There are also pay schools of shoe stitching, millinery and dressmaking, but it is the common opinion and testimony that they are generally unsuccessful, and are money-making schemes exploiting the child.

Thus we see that the boy who has managed to enter a skilled industry or a desirable low-grade industry before sixteen has gained an opportunity to get a foothold in the industrial world. However, it is little more than a foothold, for these years of adolescence require careful and attentive supervision to get from them the highest possibilities, and the shop-trained child is to-day promised nothing until he is at least sixteen years old. What he has gained in his trade before that time is pure chance, and by his own effort. But even this is so much more the exception than the rule that we must turn to the school, to see what these years might mean.

It remains to compare the shop-trained child, having an unskilled occupation at fourteen or fifteen, whether in his chosen trade or not, with the child trained in our existing technical schools. A comparison between the boy who has remained in the regular high school with either of these groups is impossible, since such a small number of those found in the industrial world, even of high order, have had all or even a part of the high school work. It has seemed strange that employers could give no opinion as to the value of our present secondary training, but we find that it is accounted for by their small experience; yet the tendency to demand the older child with more schooling is apparent.

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[1] A description of the excellent work of this school by Mr. Alexander will be found in the Civic Federation Review, February, 1906. Published by the National Civic Federation, New York. See also Table No. 11.

The accompanying chart and tables show more graphically than words the difference in wage opportunities for the shop-trained and the technically trained child. The much greater initial wage and a difference between $12 and $30 at the age of twenty-five is sufficient evidence of the value of technical education. It must be noted that in this schedule the shop-trained child means the "helper."

But this result brings inquiry. What is the work for which this type of training fits the child? In one school of this type in this State, — perhaps the most practical of all, — 18 out of 34 graduates have entered advanced technical schools, while only 2 are journeymen machinists; 5 are draftsmen, 6 are engineers, superintendents, firemen, contractors or inspectors, 5 are holding commercial positions in mechanical industries and 1 in an insurance company. In another school of the same character reports show that, of those graduates in 1903 from whom returns have been received, about 37 per cent. advanced to higher institutions and 42 per cent. went into mechanical occupations.[1] In the most practical school of all, the California School of Mechanical Arts, in San Francisco, the returns from 65 students are equally important. Of the total number, only 18 are journeymen, earning what is almost too high a wage for a journeyman, $70 to $100 per month, while 44 attended college and are holding positions as draftsmen, or have advanced to superior positions as captains of industry. Only 3 are in commercial positions.[2] It is most instructive to see that 26 out of 55 started under $10 per week, while

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[1] Occupations of graduates: —

Number continuing in a higher institution,	35
Number entering mechanical trades,	40
Number entering commercial occupations,	19
Number not heard from,	19
Number died,	1
Number of graduates,	114

[2] Occupations of graduates in California School of Mechanical Arts: —

Number entered college,	13
Number of draftsmen,	13
Number in superior positions,	18
Number in journeymen's positions,	18
Number in college,	3
Number of graduates,	65

the average initial wage was $10.34. It seems, then, that the technical school does not fit the child for the position of journeyman, nor are these boys to be found in the trades other than electrical, engineering or machinery trades. Not one from either school is in a building trade, in the printing or publishing business, or in any of the great manufacturing industries, outside of the machine shops. These results surely show that technical education sends the child into the industrial world; that the boy with the technical education advances much more rapidly and surely than the shop-trained boy in the mechanical trades; and that most become the captains of industry, superintendents, or sometimes foremen. That such schools are desirable is not to be questioned. But it must be admitted that they offer preparation for the mechanical trades only, and that they do not aid the other industries. Children who are in these industries are not attracted by the existing technical schools, hence they do not reach the great mass who could attend school longer.[1] The training which will reach these classes must be more practical, and bear more directly on industrial life. It must take the child at fourteen, and not wait for him to graduate; it must give him academic work more closely related to the specific industry; and it must not attempt to give him "all of the academic work that is at present given in the regular high school, and shop work besides."

The ability and desire on the part of parents to send their children to schools which shall look toward a trade has been discussed for each of the cities in the preceding sections, and will be summarized in the conclusion; but let it be repeated here, that, exclusive of the foreign element, the majority of parents are enthusiastic over the opportunity, and await anxiously a movement toward it, while three-quarters of the families are so situated that their pecuniary circumstances would permit and their spirit would lead them to patronize such centers.

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[1] A visit to the homes of boys in one of our largest schools of this type, taken in the poorest districts, from which they come, show that all were above the grade of family found in any of the other industries except the machine shops.

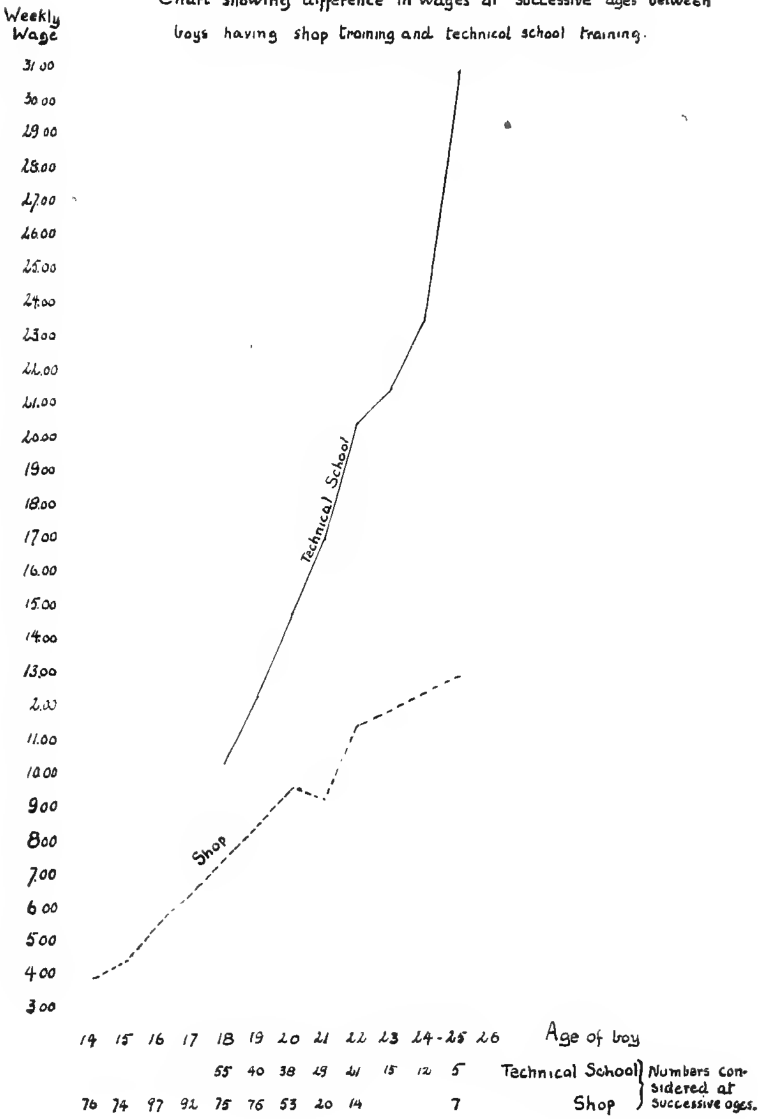
Chart showing difference in wages at successive ages between boys having shop training and technical school training.

Weekly Income at Successive Ages, from Fourteen to Twenty, of Boys trained in the Trade, based on Investigation of Families.

	Number of Children earning a Weekly Wage of —																
	$2 to $2.50.	$2.50 to $3.	$3 to $3.50.	$3.50 to $4.	$4 to $4.50.	$4.50 to $5.	$5 to $5.50.	$5.50 to $6.	$6.	$7.	$8.	$9.	$10.	$11.	$12.	$12 +.	Total considered.
High-grade Skilled Industries.																	
Machinery: —																	
At fourteen years of age,	1	–	23	6	19	6	7	2	7	1	–	–	–	–	–	–	72
At fifteen years of age,	1	–	18	2	12	10	13	2	12	1	1	–	–	–	–	–	72
At sixteen years of age,	–	–	7	2	11	10	20	7	22	10	3	2	–	–	–	1	95
At seventeen years of age,	2	–	6	–	7	4	9	3	24	17	9	6	3	–	1	2	93
At eighteen years of age,	–	–	3	–	1	1	3	1	16	15	8	14	5	1	6	1	75
At nineteen years of age,	–	–	–	–	1	1	3	–	10	17	8	11	13	–	8	4	76
At twenty years of age,	–	–	–	–	–	1	2	–	5	7	9	8	7	–	5	9	53
Totals,	4	–	57	10	51	33	57	15	96	68	38	41	28	1	20	17	536

Weekly Income at Successive Ages, from Eighteen to Twenty-five, of Boys trained in Technical Schools, based on Reports from Schools.

	Under $8.	$8 to $11.	$11 to $14.	$14 to $17.	$17 to $20.	$20 to $22.	$22 to $25.	$25 to $30.	$30 to $45.	Totals.
At eighteen years of age.	18	16	7	10	3	1	–	–	–	55
At nineteen years of age.	6	13	6	9	2	3	1	–	–	40
At twenty years of age.	3	1	11	7	7	3	1	2	2	38
At twenty-one years of age.	2	2	3	11	6	3	1	1	1	30
At twenty-two years of age.	–	1	2	2	6	5	1	2	2	21
At twenty-three years of age.	–	–	1	1	4	3	2	2	2	15
At twenty-four years of age.	–	–	–	1	1	4	–	2	4	12
At twenty-five years of age.	–	–	–	1	–	–	1	–	3	5

V. WHAT THE VALUE OF THE YEARS FROM FOURTEEN TO SIXTEEN MIGHT BE TO GIRLS.

This section was prepared, at the request of the Sub-committee, by
Miss FLORENCE M. MARSHALL, A.B.,
Director of the Boston Trade School for Girls.

It is most difficult to discover how many girls between fourteen and sixteen are at work in this State, but the age and schooling certificates, seem to indicate that about 45 per cent. of the children who go to work at these ages are girls. Apparently the grade at which they leave school is about the same as for boys, although girls having once entered the high school are more likely to finish their course.

What do the girls do? The following table gives the returns from the age and schooling certificates of Boston and Worcester, our great commercial centers: —

Certificates issued to Girls, 1905.

EMPLOYMENTS.	Boston.[1]		Worcester.[2]	
Unskilled industries: —				
Department stores,	609	84 per cent.	105	70 per cent.
Textile mills,	99		44	
Confectionery and packing,	118		25	
Low-grade skilled industries: —				
Boots and shoes,	115	11 per cent.	26	10 per cent.
High-grade skilled industries: —				
Millinery and dressmaking,	47	4 per cent.	49	20 per cent.

[1] These figures are taken for certain representative months of the year, 1,710 certificates, to boys and girls.

[2] There were 513 certificates.

Evidently the commercial centers claim as large a proportion of girls for unskilled labor as do the textile centers. In textile industries we find a little larger percentage of girls than boys, especially in hosiery and knitting mills.

In the industries throughout the State girls under twenty are employed in seven occupations: (1) service in stores as cash and bundle girls; (2) the textile occupations of cotton, wool and silk; (3) packing, as in confectionery, crackers and paper; (4) pasting, as in rubber shoes, box making and piano action; (5) soldering and engraving, as in jewelry; (6) stitching, as in knitting mills, ready-to-wear clothing of all types, shoes and straw hats; (7) hand needlework in dressmaking and millinery.[1]

The fourteen to sixteen year old girl is admitted to the textile industry, although not of the better grade, to the department stores, and to confectionery and cracker factories. A very few indeed are to be found in the stitching, pasting and soldering occupations, or in the needle trades.[2]

The conditions in the mills, which hold alike for girl and boy have already been discussed, and the equally limited opportunity for the worker in rubber, both with regard to advancement to skilled occupations and to a wage above $8. Furthermore, it is seen that the department store takes the girl into a juvenile industry, with all of the evil consequences of low pay, of subjection to the rudeness of the world, and of instability of character and purpose.

What, then, are the desirable occupations, what are the opportunities in them, and how does the girl gain admission to them? These center about the needle and the decorative trades. The former offers four types of work: the boot and shoe trade, which has already been discussed; the glove trade, which has been developed to a surprisingly small extent in this State, where leather work is so important an industrial feature; the straw hat manufactory; and millinery and dressmaking. The glove trade certainly has a future not only as an industry of the State but as an opportunity for girls. Its one need today is skilled operatives, so declare the employers of the three factories in this State, — a fact proved by the action of the employers at Gloversville, N. Y., where they have opened a school for operatives. The straw hat industry offers a better grade of work, cleaner and nicer materials, higher wages to the skilled worker, and, more than all, a variety and change of work which tends to develop rather than to stultify the worker. Furthermore, the combination of felt with straw work avoids short seasons. Until the last few years this work has been done in small communities, but it is rapidly drifting toward Boston; consequently, the city employer secures his labor from the country places where the factories have closed, or from country factories. This means that the latter must teach many new girls each year. But the straw factory will not take the girl under sixteen, and usually requires her to be eighteen or twenty. Among 9 factories, employing 1,600 operatives, but 2 are under sixteen years of age. The consequence is that all except 2 employers declare that training for this trade is most desirable, and deplore the necessity of waste of material and time. But the wages are perhaps better than in almost any trade, unless it be in millinery and dressmaking, for the girls can make $18 to $20 per week, and a maximum of $25 is not unusual. The older girl or the trained girl can enter these most desirable industries, whereas the girl commencing under sixteen must drift before she is received. The two other trades offering large opportunities to girls are millinery and dressmaking, each with extraordinary possibilities to the skilful and artistic woman. The younger girls are seldom admitted to these industries except as errand girls. The age and grade requirements, as shown below, force the girls wishing to enter these trades to have attained the age of sixteen, or to have finished the grammar grades.

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[1] Typesetting and press work afford a good occupation to a few. About the only running of machines outside of the needle trades is to be found in envelope and box making.

[2] In 47 ready-to-wear clothing factories visited in Boston, Springfield and Worcester, only 185 out of 4,882 employees were under sixteen. In jewelry and paper factories the proportion is also very low.

	Number of Firms considered.	Number Sixteen Years of Age.	Number of Grammar Graduates.	Number in High School.	Number of Apprentices.
Millinery, .	30	15	5	1	29
Dressmaking,	14	10	2	–	2

These are the only industries in which the claim is made that the apprenticeship system exists for girls, while investigation shows that it actually exists in millinery only. Before the girl will be accepted she must know how to sew well. She must give one season or two seasons before she is compensated, and she then advances in fifty-cent or one-dollar steps. It is two or three years before she can earn $5 to $6, and two or three more before she reaches $8, $10 or $12, the average maximum wage, although the wage and skill opportunities are limitless to the capable artist.

In dressmaking the study of 31 so-called apprentices showed the initial wage in the second year as $3 or less, the advance in the second year to $3.50 or to $5, and by the fourth to $6 and $7. In millinery the first wages were $2 to $3, the second year $4 to $5, and the third $6 or $8. The age of these girls ranged from fifteen to eighteen, while more than half had not graduated from the grammar grades. Almost all the millinery girls and a third of the dressmaking girls had been in unskilled employments for a year or more, but forsook an occupation with more wage in order to learn a trade.[1]

A further study of 53 girls in millinery and dressmaking, representing 28 families, in Boston and Cambridge, shows the family conditions, as follows: two-thirds are good-grade families, with little more than half of the other members of the family in skilled industries, and 85 per cent. are in such circumstances as to afford continued schooling, although about half are not grammar graduates, and only 4 are of high school grade. Out of 43 milliners and dressmakers, 30 do not take children under sixteen, and 35 declare that they are of no value to the industry except for errand work. Moreover, 38 feel that the children should have general industrial training, and 21 of these that such education should be of a trade character. Thus, as with boys, we find the highly skilled industry refusing the girl before sixteen, except for errands, but taking her after sixteen if from the slightly better class of home.

The trade of machine operating is not so easy to understand. It employs many women and girls, but the conditions vary.[2] In New York, where much work is done on special machines and much fine work is turned out, the opportunity for advancement in work and wage is good; but conditions in Boston and Worcester are not so favorable. The industry is not highly skilled, but it prefers the sixteen to the fourteen year old girl, and in many cases does not take the younger girl at all. But the grade of family is lower than in millinery and dressmaking, the proportion of unskilled workers in the family is greater, the proportion of grammar graduates is but one-third.[1]

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[1] See the tables on apprentices, conditions and wages, pages 62, 63.

[2] In 47 firms visited there were 4,882 employees.

We find a great deal of instability, although the percentage of those able to afford continued training is over 85 per cent. The wage opportunity in this great industry for women is discouraging. Even the best grade of work in this State does not pay over $9 or $10, while the initial wage is from $2 to $3, and the average maximum is $7 or $8, attained in three or four years. It remains to be seen whether the increase of the special machines and of the finer and more artistic work in this State will mean as good opportunities as exist in New York, or whether the trade is to be relegated to the undesirable low-grade industry, for which training is of little value.

What the years from fourteen to sixteen might mean to the girl in industry if continued schooling or teaching in the industry were afforded is essential to a solution of the problem. We have found that the girl who does not enter the industrial world until she is sixteen has by far the greater chance to enter a desirable industry. The opportunities for advancement for the girl who goes to work at fourteen are well-nigh ruined, since some years must be spent in a low-grade industry. Teaching in the industry has almost ceased, and the creation of trade schools, long and short course, is coming to be a necessity. Are they filling the need? Is the girl of fourteen able to receive industrial training which will result in productive power, and greater productive power than with the regular school work? A study of the few existing schools has proved that the girl starts, after a year or two of training, with a wage in excess of what she would have gained had she been able to enter the industry itself at the earlier age, and with a better wage than had she remained in the public school. Although she practically starts in at the beginning, since she has by no means become an expert workman, she advances more rapidly and more surely than the years in the industry would warrant.

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[1] This is based on the study of 271 individuals in 185 families in Boston and Worcester.

It is evident, then, that the girl of the present day who is obliged to enter the world of industry is in a unique position. More than half of all the girls in our great industrial centers are confronted with the necessity of earning a living between the ages of fourteen and eighteen, and yet many of these girls are to be the home makers of the future. The opinion shared by a large majority of people is that woman's place is in the home, and that the education of girls should be of a nature which will fit them for that sphere. Such a preparation is without doubt the hope and strength of the American family; but since we see that the schools are to-day holding less than half of the girls after the completion of the grammar grades, and that those who drop out of school are going into some form of industry, the problem becomes one of making the industrial life of the girl supplement or at least not destroy the home training which the grammar schools are attempting to give. The question is, how to hold to the ideal for the home in the future, and meet the necessity for earning a living in the present. The girl must inevitably get a large part of her training in the industry where she is obliged for some years to earn her living; and is it not possible for the school to train her to enter that form of industry which will mean further development along the lines which the school has started?

As we have just seen, the kinds of employment now open to girls who leave the public schools are of a nature which require no skill, and which offer no opportunity for advance in either wage or position, and, as a consequence, are a positive detriment to the girl. They demand very little thought, leaving the girl's mind open to all sorts of evil, just at the age when she most needs something requiring the exercise of her mental faculties; they offer as a maximum wage that which is not sufficient for the girl to live upon in any degree of respectability, and thus place her in the way of temptation to be immoral; they not only offer no training which will be of benefit in a home, but they develop in the girl just the characteristics which unfit her as a wife and mother. As long as the schools do not train the girls for the better class of industry, they are forcing them into the stores as cash girls, into the candy factories, into rubber factories, box factories and the like, and these employments are tending to lower the standards of our women.

On the other hand, the more desirable industries, as the investigation shows, offer opportunities for self-support, for advancement, for development; and these are at present closed to the young girl because of lack of training. We find almost unlimited demand for girls as dressmakers, as milliners, as machine operators, and as workers in domestic service. This sort of work, while not directly fitting for the home, nevertheless has a very decided bearing upon it, in that it deals with food, clothing, decoration, and the principles of buying. It offers opportunity for that kind of expert knowledge which could be turned to good advantage in the home.

What are the schools doing for the girls? The grammar grades are doing something, and the high schools are doing little or nothing. In many of the grammar schools, where sewing and domestic science are given, the work is made to cover too much ground and too many principles. Something is wrong when we find college classes, high school classes, and grammar grades all dealing with the same problems. The grammar schools, instead of confining themselves to the teaching of the simple principles, advance too rapidly to the more complex problems, contrary to educational theories, as applied to academic work. Dressmaking is something which the grammar school girl of fourteen cannot comprehend, any more than she could advanced mathematics. If the grammar schools would confine their work to instilling the simple principles of sewing, cutting and construction of articles, with the right use of the proper tools, including the machine, as well as the needle, in the same way in which they teach the principles of arithmetic, step by step, as a foundation for higher mathematics, they would better fit the girl for either the home or the industry. We should feel that something was wrong with the teaching of our children, if, having learned addition in school, they could not add at home; yet we allow the girl to make one garment at school, under the direction of the teacher, and blissfully pass her on to the next more difficult step, without ever stopping to think that it would be impossible for her to repeat the work without the aid of a teacher.

Before the sewing of the grammar schools can be of any great value to the child, either for the industry or the home, it must deal with fewer principles, applied in a greater variety of ways, and on a greater variety of materials. The work must be such as to repeat processes over and over, to give a solid foundation for later work. This does not mean that it should not be creative, but that it should be adapted to the child's ability.

The work in housekeeping and cooking, which is being taught in our public schools, is of a somewhat higher order than the work in sewing. It does not, however, begin early enough, nor have the schools supplied sufficient equipment to make the work as strong as it should be. Helping mother with the dishes, spreading the table, dusting, etc., buying food at the corner grocery, helping with the care of the younger children, are the natural activities of the young child; and the schools should carefully study these, with relation to the girl's development as a home maker and to her physical development, and so grade their work as to instill in her a taste for home making, and develop her power of judgment and responsibility.

The fulfillment is not possible unless the work is carried on in our secondary schools. The independent responsibilities which are needed for the care of the home or for the industry are things which the younger children cannot comprehend. As long as the grammar schools are obliged to do it all, there will inevitably be the attempt to crowd in things which do not belong there, rather than to have the child miss them altogether. The grammar schools should lay the foundations for the work of the woman, but they should not attempt to teach a child to do a woman's work. It is as absurd for a child of twelve and fourteen to plan and construct a dress as it is for a boy of fourteen to build a house; it is as wrong for a girl to be required to make a garment of heavy bleached muslin with a needle as it is for a boy to cut a log of wood with a jackknife; and yet these are at present the practices of the grammar schools.

Beginning with the child's play life as a center, leading out into the activities of the home and then into the industry, the work should gradually increase in amount and in complexity from the lower grades, and be carried on through our secondary schools. We need more time for industrial work in our grammar schools, greater continuity in our work, and better adaptation to the physical and mental development of the child. Not only does the work in our grammar schools lack system and definite aim, but just at the time when the girl is most interested in the activities of the home, or the preparation for some line of employment, suddenly all of our industrial work in the schools comes to an end. Many of our girls who now go to work at fourteen or fifteen would be glad to remain in school for another year or two, if by so doing they could receive training which would assist them in getting into some better line of work. As this is not possible with the amount and kind of training now offered by the grammar schools, they are forced into unskilled employment, with little or no hope for the future.

Philanthropic institutions have seen the need of some definite training for the industries, but by far the larger part is done either for the children under fourteen, to supplement their school work, or for the older girl, who, having gone to work, has discovered the lack of opportunity, and has sought some means by which she could better her condition. The classes conducted by the settlements, by the Young Women's Christian Association, and by the Women's Educational and Industrial Union of Boston, represent the best of this sort of work. Industrial schools have been established for girls who have gone wrong, but with few exceptions the work so far done has been in the way of correcting previous faults in our education, rather than forestalling the evils that come from the lack of more industrial training.

The settlements and clubs have helped to augment the work of the grammar schools by conducting classes in cooking and sewing after school hours; but it has been impossible to give enough time or definiteness to the work to make it a preparation for entrance into the skilled industries.

The Boston Trade School for Girls has made a serious effort to appeal to the girl who is obliged to leave the grammar school to go to work, by offering specific all-day instruction which will enable her to get into the right kind of employment. For nearly two years The Boston Trade School has been in operation, and has given instruction in hand sewing, dressmaking, millinery, machine operating, design, hygiene, and domestic science, primarily from the standpoint of the industry, in order to give the girl an opportunity for entrance into the better class of skilled employment, with ample chance for advancement. With the same object in view, the Women's Educational and Industrial Union has conducted classes to train girls for salesmanship, wire frame making and hat making.

The result of this work has shown that definite training for an industry which requires skill makes the girl more responsible, more reliable and more womanly. Could the short course, which has been necessary, be extended to two or three years, the deficiency in responsibility and reliability might be met through academic training and as a result of maturity.

Other States are beginning to see that the needs of all girls are not being met by the classical and English high schools, and are introducing advanced work in the household arts and sciences. In many cases, sewing, domestic science and applied design are carried on during the whole three or four year courses. The work in most if not all of these schools is designed to give the girl the training which is needed for the home; and, being of a practical character, appeals to many girls who, desirous of greater physical activities at the ages when the work of the grammar school is completed, would otherwise go into some form of industry, even when there was not the absolute necessity to do so. Such schools are having the greatest beneficial results, but are not meeting the complete needs, in that they are not preparing for the industries. In St. Louis, where work of this character is introduced into all but one of the public high schools, the number of girls in these schools has more than doubled in the last two years. In the Brooklyn Manual Training School, which also offers this sort of work for girls, the numbers have increased from 1,000 to 2,300 in one year.

The value of the training which girls are receiving in these schools is apparent even to the casual visitor. The effect of the work in domestic science upon the school luncheon, where everything is orderly and attractive, the earnestness with which the work in millinery and dressmaking is carried on, and the application of the principles of design and color to the decoration of the schoolrooms, show clearly that these schools are helping to develop domestic and womanly traits of character.

Other schools where similar results have been shown are to be found in the Lewis Institute in Chicago, the Bradley Polytechnic in Peoria, Ill., and in the Girls Technical High School in New York City. In Alleghany, Pa., two years of industrial work for girls is just being introduced into the public high schools, and in many other cities the special work for the girls is receiving much attention.

While the work in these schools is admirable so far as it goes, they are still reaching less than half of all the girls. Hence the special training of the girl who must early become a wage earner has thus far been met by private institutions alone; but the work being done in these institutions is of a nature which might well be undertaken by public industrial schools, in that it would meet the needs of more than half of our girls of high school age.

Types of institutions outside of this State which are offering a practical education to girls who are facing the necessity of self-support are Pratt Institute in Brooklyn, N. Y., where special courses are given to prepare girls who are sixteen and over to be seamstresses, dressmakers, milliners, embroiderers and engravers on jewelry; and the Manhattan Trade School for Girls in New York City, which takes the girl at fourteen and gives her a year of training in the needle and pasting trades, to fit her to become a helper in the better class of industries.

Other institutions which are dealing with similar forms of education are the Hebrew Technical School in New York City, the School of Domestic Arts and Sciences in Chicago, the Mechanics Institute in Rochester, N. Y., and the Margaret Carnegie Technical School for Women, which is just now being started in Pittsburg, Pa.[1]

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[1] The Margaret Carnegie Technical School has extensive plans for the training of girls over sixteen. These courses are as follows: professional housekeepers, dressmakers, costume designers, bookbinding, leather work and upholsterers, needlework and embroidery, milliners' and dressmakers' assistants, seamstresses, working housekeepers, housemaids, laundresses, cooks, waitresses, interior decorators and designers. See also Table No. 11, pages 122–127, *post*.

From a study of the needs and from an investigation of what is being done in other States, it would seem that two distinct types of training should be offered to girls: —

(1) Courses in the household arts and sciences should be introduced into our public high schools, that girls may receive a thorough and practical training for home life.

(2) Special schools, offering both day and evening work, should be established, where girls might receive a definite preparation for some form of industry. These schools should be planned to meet the needs of the fourteen-year-old girl who must of necessity become a wage earner. The work of such schools should be largely industrial, with academic work closely applied to the industries taught, and should be so arranged that each year would mean definite preparation for some part of the industry.

As long as we dwell solely on the ideal education, and blind our eyes to the necessity for self-support, which in our modern industrial civilization is facing a majority of our girls, we are not meeting the issue. We must look to the industry to either supplement or destroy what the schools can give these girls up to the time when they are fourteen, fifteen and sixteen years of age. If we can prepare them to enter employments where they can develop in intelligence and skill, and where they can earn enough to be respectable, we are improving the quality of our women and hence of our home makers.

If the standard of the working women in the State of Massachusetts is to be kept up to the high level which it has maintained in the past, more opportunities for industrial training must be offered to our girls.

The following table shows the difference between the wage income and the advance in wage income for the trained and the untrained girl, presented for the purpose of illustrating the success of practical teaching in developing a gradual and moderate productive power: —

WEEKLY INCOME AT SUCCESSIVE AGES, FROM FOURTEEN TO TWENTY.

Weekly Income at Successive Ages, from Fourteen to Twenty, of Untrained Children, based on Visits to the Family.[1]

	NUMBER OF CHILDREN EARNING A WEEKLY WAGE OF—													
	$2 to $2.50.	**$2.50 to $3.**	**$3 to $3.50.**	**$3.50 to $4.**	**$4 to $4.50.**	**$4.50 to $5.**	**$5 to $5.50.**	**$5.50 to $6.**	**$6.**	**$7.**	**$8.**	**$9.**	**$10.**	Total considered.
High-grade Skilled Industries.														
Millinery and dressmaking: —														
At fourteen years of age,	1	1	1	–	–	–	–	–	–	–	–	–	–	3
At fifteen years of age,	2	–	4	1	–	–	2	–	–	–	–	–	–	9
At sixteen years of age,	–	3	6	2	4	1	2	1	3	–	–	–	–	22
At seventeen years of age,	–	–	4	–	3	2	–	–	2	1	–	–	–	12
At eighteen years of age,	–	–	2	–	1	–	–	–	5	–	1	–	–	9
At nineteen years of age,	–	–	–	–	–	–	1	–	1	–	–	–	–	2
At twenty years of age,	–	–	1	–	1	–	2	1	1	–	2	1	2	11
Totals,	3	4	18	3	9	3	7	2	12	1	3	1	2	68
Low-grade Skilled Industries.														
Machine operating: —														
At fourteen years of age,	12	3	25	3	3	–	2	–	–	–	–	–	–	48
At fifteen years of age,	16	8	28	12	17	2	1	–	4	1	–	–	–	89
At sixteen years of age,	5	2	13	11	12	5	12	2	3	7	1	–	–	73
At seventeen years of age,	1	1	10	2	9	4	14	2	11	3	5	4	1	67

At eighteen years of age, .	1	–	3	2	6	2	9	2	8	5	3	2	1	44
At nineteen years of age, .	1	–	–	–	2	1	4	1	13	4	4	4	4	38
At twenty years of age, .	–	1	–	1	1	–	4	–	6	6	1	3	1	24
Totals, ...	36	15	79	31	50	14	46	7	45	26	14	13	7	383

Weekly Income at Successive Ages, from Fifteen to Twenty, of Children trained in Short-course Trade Schools, based on Reports from Schools.[2]

High-grade Skilled Industries.													
Millinery: —													
At fifteen years of age, .	4	–	9	1	4	–	2	–	–	–	–	–	–	20
At sixteen years of age, .	1	1	8	2	12	1	8	–	1	–	–	–	–	34
At seventeen years of age, .	1	–	1	1	6	3	12	1	3	–	–	–	1	29
At eighteen years of age, .	–	–	1	1	–	1	2	–	5	1	–	1	–	12
At nineteen years of age, .	–	–	2	–	–	–	–	–	2	–	–	2	–	6
At twenty years of age, .	–	–	–	–	2	–	–	–	–	–	2	–	–	4
Totals, ...	6	1	21	5	24	5	24	1	11	1	2	3	1	105
Dressmaking: —													
At fifteen years of age, .	–	3	5	2	15	1	5	–	1	–	–	–	–	32
At sixteen years of age, .	–	–	6	–	24	8	11	–	8	–	–	–	–	57
At seventeen years of age, .	–	2	8	–	8	9	13	1	12	4	–	–	–	57

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[1] It must be remembered that employers have declared, and investigation proves, that children under sixteen who have not been trained are usually employed for errand work.

[2] These tables are based on schedules kindly filled out for this investigation by the directors of the Boston Trade School for Girls, and the Manhattan Trade School, New York City. The latter has just issued this table in the annual report.

WEEKLY INCOME AT SUCCESSIVE AGES, FROM FOURTEEN TO TWENTY — *Concluded.*

Weekly Income at Successive Ages, etc. — Concluded.

	NUMBER OF CHILDREN EARNING A WEEKLY WAGE OF —													
	$2 to $2.50.	**$2.50 to $3.**	**$3 to $3.50.**	**$3.50 to $4.**	**$4 to $4.50.**	**$4.50 to $5.**	**$5 to $5.50.**	**$5.50 to $6.**	**$6.**	**$7.**	**$8.**	**$9.**	**$10.**	**Total considered.**
Dressmaking — *Concluded.*														
At eighteen years of age, .	–	–	1	–	6	4	10	1	4	6	–	1	–	33
At nineteen years of age, .	–	–	1	–	2	–	3	–	6	1	–	–	–	13
At twenty years of age, .	–	–	–	–	–	–	1	–	1	2	–	–	–	4
Totals, ...	–	5	21	2	55	22	43	2	32	13	–	1	–	196
Low-grade Skilled Industries.														
Machine operating: —														
At fifteen years of age,	–	–	2	–	9	3	5	–	–	1	–	–	–	20
At sixteen years of age,	–	–	–	2	11	1	6	2	9	1	1	–	–	33
At seventeen years of age,	–	–	–	–	5	2	10	3	7	6	2	–	–	35
At eighteen years of age,	–	–	1	1	2	–	5	–	3	2	2	1	1	18
At nineteen years of age,	–	–	–	–	2	–	1	–	1	–	–	1	1	6
At twenty years of age,	–	–	–	–	–	–	1	–	1	–	–	–	–	2
Totals, . .	–	–	3	3	29	6	28	5	21	10	5	2	2	114

VI. SUMMARY.

Having discussed the peculiarities of industry and of location in various cities, certain prevailing conditions and certain universal needs may be enumerated.

(1) It is true that returns from the entire State show that large numbers (fully 25,000 in all) of children go to work or are idle at fourteen and fifteen, but the proportions vary in various centers. Thus, in textile centers the numbers entering industrial life are greater even than in commercial centers. But in the rural communities and the smaller industrial centers, where high-grade skilled or low-grade skilled factories exist, not employing juvenile labor, the numbers are proportionately smaller. Then, too, in commercial centers we find a few children taking a year in the high school and then entering a private business school or taking commercial courses to fit them for positions in the world of trade. It is evident, then, that the relations between industrial conditions and the education of the children are close. Does the child remain in school because he wishes to, or because there is "nothing else to do"? Superintendents of schools in rural districts tell us that it is extremely difficult to hold the child in school, and that he either "loafs" or goes away from home to seek employment, risking all of the hardships and dangers of life away from home. The problem is therefore more universal than at first it seems; but it must be studied in connection with local conditions on the one hand, and general opportunities on the other.[1]

(2) The grade which these children have completed is an important factor in the discussion. The further education of the child for the industrial world must consider two classes, the one which has completed the grammar school at fourteen or fifteen, and the one which has had less schooling. But since only one-sixth of this number have completed the grammar grades, such education must be planned for the five-sixths leaving school in the seventh or eighth grades.

(3) The class of family seems to have but little to do with

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[1] Reports from superintendents of schools in rural communities show that large numbers drop out of school before graduation from the grammar grades, and especially from the high schools, although few age and schooling certificates are issued.

the child's dropping out of school, except when the grades below the seventh are considered.[1] It is age which brings the child the desire to begin to do something; and, as has been seen and will be discussed later, this exactly corresponds with his ability to learn to produce and gradually to become a factor in the industrial world. At fourteen he is physically ready and mentally and morally anxious to cease imitating and to become creative.

(4) Who decides whether the child shall leave school? The child. Mother after mother declares, "We wanted him to stay in school." The theory that the parent puts the child to work as soon as he can is not tenable, except for the lower foreign element (and even in Lowell almost as large a percentage of the children of native parents are at work as those of foreign parents). Read with the visitor history after history of the child and of the family, and you will find that the child left school from choice, and that the parents objected.[2] But it is much easier to keep the child in school than to put him back into school, and hence the statement that it is necessary for the child to work is often coupled with the declaration that the parent wanted the child to remain in school. The pathetic moment is not when the child leaves school, but when, having been at work, he is thrown out by "slack times," or "quits work" because he does not like it. He will not return to school, and he cannot find a chance to learn a trade. "What shall we do with him?" is the almost tragic question; and the visitor is equally helpless, since she knows that his chances to enter a desirable trade at fifteen or even sixteen, with a seventh-grade schooling, are few. There are plenty of opportunities for the older boy with more education, but this one must drift yet a year or two, if not longer, or always, and be content with unskilled labor.[3]

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[1] In the high-grade skilled industries 63 per cent. of the families are classed as good grade, while only 40 per cent. have graduated from the grammar grades. In the low-grade skilled industries the proportions are 48 per cent. to 22 per cent.; and in the unskilled, 43 per cent. to 28 per cent.

[2] The report of those who left school from necessity is as follows: high-grade skilled industry, 401; low-grade skilled industry, 1,109; unskilled industry, 940; total, 2,450 out of 5,459.

[3] Sixty-eight per cent. of those found at work under sixteen are in the unskilled industries and the textile mills, as opposed to 9 per cent. in the high-grade skilled industries, and 22 per cent. in the low-grade skilled industries, outside of the woolen mills.

The responsibility of the school is great. We know how valueless is the constant and universal complaint against "the teacher." Is it not rather the subject taught and the way of teaching it, in addition to the numbers taught, which are responsible? Do not all of these faults prevent the consideration of the individuality of the child, which is an attribute of adolescence? Out of 35 or 40 superintendents interviewed in all sections of the State, all except 3 are of the opinion that the great lack is in the system, which fails to offer the child of fourteen continued schooling of a practical character, introduced and maintained by a central authority, especially qualified to know what should be done and how to do it, as local powers could not.

(5) The industry which the child enters is not determined by family connections, except in case of a few desirable apprenticeships. All grades of families are represented by their children in all grades of industries. In the mill center, the less intelligent although perhaps the more thrifty child enters the mill; in the commercial center, he enters the department store or the office. The problem is, where to put the child. The choice of a vocation for which the child is fitted is impossible, not only because no one has had an opportnnity to discover it, but because the industry which could be said to have a vocation is not open to him until he is fifteen or sixteen.

(6) We have seen in detail that the results of entering the unskilled industries range according to the class of industry. Of what educational value are the years in these occupations? The mill affords a more rapid advance in wages for a year or two, but the maximum is attained in a few years. It holds the boy or girl, once having entered, and does not permit of development or advancement to a desirable occupation, unless accompanied by training.[1]

The low-class factories, such as rubber, confectionery, and paper, afford the girl less wages and less opportunity, although they are perhaps more desirable in influence; but they never lead to anything which means development or growth in the industry itself, nor do they serve as a training for any other industry, while they certainly afford no preparation for home duties.

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[1] For the wage conditions and opportunities, see tables Nos. 9 and 10.

Department stores and errand positions do not afford a living wage, and offer no opportunity for advancement to one. They are distinctly bad in influence, since the younger employee is so shifting, resulting in instability of character. When the child has reached sixteen or seventeen, he or she must begin again at the bottom.[1]

Sixty-eight per cent. of the children who commence work between fourteen and sixteen are subjected to the evil influences of these unskilled industries or are in mills. They have wasted the years as far as industrial development is concerned, and in many cases they have forfeited the chance ever to secure it, because of lack of education.[2]

(7) The other one-eighth of our children manage to enter the low-grade skilled or high-grade skilled industry. With what result? The exceptional few, through friend or father, become apprentices in a skilled industry. But note that the age of acceptance of even the few apprentices has been shown to be sixteen or eighteen; most of them have drifted from one to three years, first. The rest of the younger employees become virtually errand boys or girls, or are put on simple work. They consider themselves fortunate because they can "steal a trade," — can become in time "helpers," and thus learn to run one machine. It is not a trade, and what little has been gained has been by force of will. "The bright boy will find his way up," is the reply to any query as to what training is given the child. But the average boy is at a tremendous disadvantage, even in a highly skilled industry. Therefore not only so few are found in the better industries, but such as do enter when young have less profit than had they been trained for those years.[3]

(8) The wage value of the years from fourteen to sixteen is hardly more than the educational value. It ranges, we have seen, from $2 to $5, seldom $6 even in the more disagreeable industries.[4] But the actual value to the family is not indicated by what the employer may estimate his productive

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[1] The discussion of these industries will be found on pages 47-54.

[2] A comparison of the proportion of grammar-grade graduates among the highly skilled operatives with that in the unskilled industries proves this statement: highly skilled, 40 per cent.; unskilled, 27 per cent.

[3] See the chart comparing these two classes of children employed in machinery, page 67.

[4] See pages 68, 69.

power. The testimony is universal that the child gives to his mother his entire pay, but that he takes back a greater part of it for car fares, lunches and better clothes, — expenses which schooling did not require. That he contributes to the family more than $1.50 is extremely doubtful. From a careful study it is apparent that the weekly wage, judged from the employer's report, is often reduced by the slack time and by the limitation on the amount of work given to be done, or by fines or expenses which the child must meet. It is true that the reports from the family may also often fail to take cognizance of this fact; but all inquiry as to wage of child or income of family has carefully considered this point, and made due allowance in the return, as far as could be judged. We have found few children leaving school to be idle, but we have found many idle, and the consequent loss to the family income must be considered, when the question of the necessity of the child's wage is discussed.

The most important fact in the consideration of wages is that the child commencing at sixteen overtakes his brother beginning at fourteen in less than two years. That his total income in four years would equal that of his brother for six years we cannot prove, but the slight data at hand so indicates.

(9) The tendency is to feel that the employment of children is a great disadvantage. The low-grade industries are taking children less and less; even the woolen mills are employing fewer children than heretofore. The result is that the children are forced more and more into juvenile employments or the lower industries.[1]

Another strong and growing tendency is to demand experienced help, and to refuse all apprentices and younger help.[2] It is certainly a problem as to where the next generation of skilled workers is to come from. Employer after employer refuses to teach, and union after union limits the number of apprentices. Both seem to say to the boy, "Not wanted here."

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[1] Out of 272 employers who expressed an opinion, 193, or 70 per cent., declared it was no advantage to the industry to employ children under sixteen. See Table No. 7.

[2] Eighty per cent. of employers declare they do not want children under sixteen, and 30 per cent. put the minimum age at eighteen. See Table No. 7.

(10) The result is a third strong tendency, — namely, to approve the teaching of the principles of the trades. This demand for skilled and experienced labor on the part of employers is by no means exaggerated. Our technical colleges have produced superintendents, — captains of industry. There are plenty of "helpers" and "lumpers" and young labor, — the rank and file of the army; but there are no expert journeymen, second hands, foremen. If the employer cannot find the responsible man to whom to entrust the $25 duties, it means the journeyman is not advancing, — is not capable of being advanced.[1]

(11) Secondary schools of four classes may be proposed to supply this need. The classical or English high school evidently should not be considered in the problem of preparation for the industrial future, since so few of the advanced students or graduates are to be found in the industrial world.[2] To it belongs the professional and commercial problem. When barely 52 out of 2,437 manual training students are found in mechanical trades, it is apparent that the school in which the manual work is introduced for cultural purposes has not met the demands of the trades. The technical high schools have been seen to fit the child rather for technical colleges or for entrance into trades, in which, as a school, the boy advances to the position of captain of industry. Such schools are certainly professional schools of a technical character. They fit for responsibility, but the training of the hand is not sufficiently practical, according to the report of 36 out of 49 graduates of one of our most successful schools of this character. Furthermore, they generally recommend less academic work, such as ancient history.[3] These schools are filled with the better class of children, coming from homes above the average or even the high grade of those whom we find in the industries.[4]

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[1] Forty-five per cent. of the employers interviewed have declared that special trade training given to the children would be an advantage; 48 per cent. have declared for general industrial training; and 71 per cent. for training in general also.

[2] Out of 5,459 children considered, but 382 have had any high school education.

[3] Most valuable reports from the graduates of the California School of Mechanics Arts, of the Springfield Mechanics Arts High School and of the Mechanics Arts High School in Boston were furnished us. It is unfortunate that they should not be printed in full. See Table No. 11 for courses and expenses of existing schools.

[4] This statement is based on personal visits to a large number of the graduates of one of the technical high schools, as also upon the testimony of the head master of another.

The short-course trade schools have proved that they interest the younger child, even for a school day of almost twice the length of the ordinary high school; that they are able to teach the general principles and larger processes of certain allied tools and materials sufficiently well to increase the productive power of the child when it enters a trade.[1] But that the responsibility of the child is not developed is declared to be the weakness of such schools. The employer has discovered by bitter experience that the fourteen to sixteen year old child is physically undeveloped, and irresponsible for any sort of work except the actually unskilled.

The development of policy in the industrial world and the experience of educators shows that the productive power of the child before fourteen is negative, and that it has not the power to handle anything but the simplest processes in the simplest and smallest way; that from fourteen to sixteen he is of productive power only for the large processes of manufacture, or for errand work; but that the child in those years, by teaching, may gain the principles of industrial work, which may be put into practice after sixteen; that, therefore, the training before fourteen should be in the simpler practical lines only; that between fourteen and sixteen it should combine the practical training in specific industries with academic work as applied to the industrial problems, to develop intelligence and responsibility.

(12) What is the position of the parent? As already noted, in the majority of cases he has not wanted the child to leave school, but his greatest distress comes when the child is out of work, and is anxious to find a chance to learn a trade. By this time he does not feel that he can afford to forego the slight income, but he is doubly anxious to aid the boy or girl. The universal approval of night schools for industrial training on the part of the more ignorant, the universal approval of day schools of similar character on the part of the more intelligent, prove the spirit of the parent.[2] It is the mother who determines the ability to give the child further opportunities; and when she declares that "any mother would afford $100 for a

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[1] Compare the tables presented in the discussion of the "girls," pages 82–84.

[2] Fifty-five per cent. of the families visited have expressed themselves as in favor of such schools.

business college if it would give the girl a better chance," we may believe the interest is genuine. Then, too, we find families apparently in poverty, sending the children to business colleges and millinery and dressmaking schools. The growth of correspondence schools is another evidence that our people can and will afford opportunities for industrial training, if they have a chance. The estimate as to the financial status of the family has been made on the income per person exclusive of the sum paid for rents, combined with the apparent condition of the family, and shows that 76 per cent. of the families are capable of giving their children industrial training if persuaded of the advantage.[1] Constant and continued inquiry of "When will it open?" "Where is it to be?" and the story of the little girl who ran a block to tell the visitor her "cousin wanted to go," have convinced us that the people are not only ready, but demanding an opportunity to obtain education which shall fit them for a better place in the industrial world.

(13) Interviews with parents show that the difficulty of gaining a knowledge of school opportunities is as great as that of becoming acquainted with industrial opportunities. A significant illustration is seen in a conversation with three foremen

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[1] The ability of the family to afford industrial training is as follows: —

	Possible.	Impossible.
Unskilled industries,	765	236
Low-grade skilled industries,	832	305
High-grade skilled industries,	407	78
	2,004	619

The financial status of the families, judging by the weekly income per person after the expense of rent has been deducted, is as follows: —

Unskilled industries: number having less than $2, 86; having $2, 84; $2.50, 84; $3, 101; $3.50, 23; $4, 70; $4.50, 7; $5, 21; $6, 7; $7, 4. Total number of families considered, 470. *Summary:* having less than $2, 86; having $2 or $2.50, 168; having $3 up, 216.

Low-grade skilled industries: number having less than $2, 71; having $2, 105; $2.50, 82; $3, 30; $3.50, 37; $4, 85; $4.50, 8; $5, 32; $6, 19; $7, 5. Total considered, 491. *Summary:* having less than $2, 71; $2 or $2.50, 187; $3 up, 233.

High-grade skilled industries: number having less than $2, 24; $2, 42; $2.50, 47; $3, 61; $3.50, 28; $4, 41; $4.50, 12; $5, 25; $6, 14; $7, 10. Total considered, 304. *Summary:* having less than $2, 24; $2 or $2.50, 89; $3 up, 191. Out of 1,265 families, 1,088 have $2 or over, and 640 have $3 or over.

in the construction of one of our largest buildings. Each had a son, and each son had entered a department store on graduation from the grammar school. All three had drifted from one occupation to another, until finally they had, at eighteen or twenty, become apprentices and helpers in the building trades. But not one of the three parents knew of the Mechanics Arts High School, and yet one was full of admiration for the New Haven school. Such opportunities must be taken to the doors of the family, or information with regard to them. Many children travel miles to and from their work, and doubtless many would do the same for schooling privileges, if informed of the chance and its meaning, and relieved of the expense of transportation.

The spirit of the missionary must be infused into such schools, if they are to reach the classes who need them. And the same spirit must be poured into our public schools, so that they may inspire our children with the dignity of labor.

VII. TABLES SHOWING THE STATISTICS GATHERED DURING THE INVESTIGATION.

Table No. 1. — *Showing the Scope of the Investigation with Regard to the Industries and the Young Employees.*

Industries.	Number of Firms visited.	Whole Number employed.	Number employed under **16** Years of Age.	Number of Employees visited between **14** and **24** Years of Age.
High-grade Skilled Industries.				
Bicycle chains,	1	25	5	–
Book binding,	2	340	–	–
Building trades,	23	–	–	–
Carriage manufacturing,	5	380	–	–
Combs, horn and celluloid,	4	723	131	–
Electrical apparatus,	5	9,500	358	62
Fur,	1	14	–	–
Glass,	1	950	35	130
Gloves,	4	145	–	–
Lamps,	1	60	–	–
Lithographing,	3	1,300	32	–
Machinery,	15	9,010	194	350
Manufacturing chemists,	1	100	6	–
Millinery and dressmaking,	43	1,179	21	54
Miscellaneous,	–	–	–	36
Needles,	1	170	–	–
Pianos and organs,	5	850	22	94
Printing and publishing,	5	2,144	28	98
Revolvers,	1	635		–
Ship building,	1	4,000	30	41
Silk stockings,	1	250	9	–
Skates,	1	150	–	–
Stenographers,	–	–	–	57
Straw hats,	9	1,602	2	–
Tools,	2	190	10	–
Various trades,	–	–	–	127
Watches,	2	4,100	17	–
Totals,	137	37,817	900	1,049
Low-grade Skilled Industries.				
Bleaching and dyeing,	2	1,560	72	–
Boots and shoes,	33	19,843	969	624
Brush manufacturing,	1	450	1	–
Carpets,	4	5,400	291	121
Chairs,	4	2,700	126	–
Hosiery and knit wear,	7	5,970	193	32
Jewelry,	10	2,435	117	111

TABLE NO. 1. — *Showing the Scope of the Investigation, etc.* — Concluded.

INDUSTRIES.	Number of Firms visited.	Whole Number employed.	Number employed under **16** Years of Age.	Number of Employees visited between **14** and **24** Years of Age.
Leather binding,	2	270	31	–
Leather tanneries,	8	881	10	–
Machine operating,	45	4,882	185	271
Miscellaneous,	–	–	–	469
Rubber,	3	2,900	68	75
Shirts,	2	1,200	50	–
Silk and silk thread,	3	2,450	152	246
Various factories,	–	–	–	228
Wooden boxes,	3	340	14	–
Woolen and worsted,	14	18,525	1,369	193
Totals,	141	69,806	3,648	2,370
Unskilled Industries.				
Cans,	1	600	57	–
Confectionery,	7	1,842	288	155
Corks,	1	15	9	–
Cotton,	24	25,179	2,028	506
Department stores,	6	10,080	1,165	368
Food products,	4	1,575	48	102
Games,	3	450	26	–
Glue,	1	100	–	–
Heavy work,	–	–	–	119
Laundries,	–	–	–	26
Messengers,	2	3,800	248	236
Paper and paper boxes,	16	3,345	146	166
Rivet and stud,	1	100	–	45
Thread,	2	2,368	359	201
United States fastener,	1	216	23	–
Wire goods,	7	1,614	112	116
Totals,	76	51,284	4,509	2,040
Grand totals,	354	158,907	9,057	5,459

TABLE No. 2. — *Showing the Cities visited for the Investigation of Industries and Young Employees.*

COUNTIES, CITIES AND TOWNS.	Number of Firms visited.	Whole Number employed.	Number employed under **16** Years of Age.	Number of Employees visited between **14** and **21** Years of Age.
Essex County.				
Amesbury,	5	1,160	25	–
Haverhill,	5	2,100	27	23
Lawrence,	5	12,620	1,495	–
Lynn,	8	11,550	315	310
Newburyport,	5	1,920	64	–
Peabody,	7	680	20	–
Salem,	5	2,256	158	–
Middlesex County.				
Cambridge,	17	3,900	157	531
Lowell,	13	18,350	655	500
Malden,	1	1,500	36	–
South Framingham,	1	400	–	–
Wakefield,	3	1,300	29	–
Waltham,	2	4,100	17	–
Woburn,	3	331	10	–
Suffolk County.				
Boston,	137	25,155	2,442	1,329
Chelsea,	5	1,765	51	–
Dorchester,	1	700	–	102
Roxbury,	2	800	53	–
Norfolk County.				
Norwood,	2	609	4	–
Quincy,	2	4,100	30	86
Plymouth County.				
Brockton,	9	6,668	58	179
Bristol County.				
Attleborough,	11	2,755	139	111
New Bedford,	6	7,722	311	248
Taunton,	4	4,275	168	223
Worcester County.				
Clinton,	5	4,800	195	–
East Douglas,	1	–	12	–
Fitchburg,	11	2,325	218	–
Gardner,	4	2,070	132	–
Leominster,	5	1,508	50	–
Northbridge,	1	600	40	–
North Upton,	1	300	–	–

TABLE NO. 2. — *Showing the Cities visited, etc.* — Concluded.

COUNTIES, CITIES AND TOWNS.	Number of Firms visited.	Whole Number employed.	Number employed under **16** Years of Age.	Number of Employees visited between **14** and **24** Years of Age.
Whitinsville,	1	1,750	19	–
Worcester,	21	7,225	452	733
Hampshire County.				
Easthampton,	2	1,400	232	–
Florence,	2	1,250	50	141
Northampton,	2	750	34	–
Hampden County.				
Holyoke,	6	5,761	590	490
Springfield,	18	4,812	454	208
Berkshire County.				
Dalton,	2	340	7	–
Great Barrington,	1	550	6	–
North Adams,	10	4,850	257	245
Pittsfield,	2	1,900	45	–
Totals,	354	158,907	9,057	5,459

TABLE NO. 3. — *Showing the Industries which Children enter at Fourteen and Fifteen Years of Age, together with the Numbers for Each, based on the Age and Schooling Certificates issued in Several Cities, in 1904 or 1905.*

TEXTILE CENTERS.

Lowell.

Unskilled industries: —		
Cotton,	785	
Woolen,	328	
Hosiery,	234	
Mercantile (stores, etc.),	22	
		1,369
Low-grade skilled industries: —		
Boxes,	5	
Bleachery,	4	
Farming,	1	
Food products,	5	
Laundry,	19	
Leather working,	90	
Patent medicines,	3	
Rubber,	4	
Tube manufacturing,	16	
Mailing company,	3	
Wire working,	8	
		158
High-grade skilled industries: —		
Firearms,	10	
Hat making,	1	
Iron working,	14	
Steel working,	14	
Wood working,	13	
		52
Total,		1,579

New Bedford.

Unskilled and low-grade skilled industries: —		
Cotton and silk,	952	
Stockings,	20	
Miscellaneous,	151	
		1,123
High-grade skilled industries: —		
Glass and silverware,		55
Total,		1,178

Taunton.

Unskilled industries: —		
Cotton,	164	
Stores, laundries, etc.,	8	
		172
Low-grade skilled industries: —		
Manufacturing (jewelry, buttons, etc.),		23
High-grade skilled industries: —		
Machinery,	23	
Printing,	2	
Cigar manufacturing,	2	
		27
Unaccounted for,		13
Total,		235

Boston.

Unskilled industries: —		
Department stores,	609	
Confectionery,	88	
Food products,	23	
Cans,	31	
Carpet,	28	
Hosiery,	57	
Metal goods,	12	
Thread and twine,	14	
Merchants (largely errand boys),	79	
Messengers,	154	
		1,095
Low-grade skilled industries: —		
Boots, shoes and leather goods,	232	
Brush,	16	
Cigars,	3	
Miscellaneous,	24	
Paper and paper box,	7	
Laundry,	1	
Mailing company,	24	
		307
High-grade skilled industries: —		
Clothing,	47	
Building,	5	
Drugs,	1	
Electricity,	9	
Machinery,	2	
Printing and publishing (book binding),	44	
		108
Total,		1,510

COMMERCIAL CENTER.

Worcester.

Unskilled industries : —		
Carpets,	21	
Cotton,	23	
Woolen,	15	
Wall paper,	4	
Messengers and errand boys in stores, etc.,	38	
Department and dry goods stores,	105	
		206
Low-grade skilled industries : —		
Bakeries,	10	
Boots and shoes and leather,	26	
Brushes,	2	
Clothing,	49	
Envelopes, paper novelties,	15	
Wire, screw and metal working,	124	
		226
High-grade skilled industries : —		
Book binding,	1	
Machinery,	38	
Printing,	2	
Foundry,	3	
Firearms,	6	
Drugs,	3	
		53
Unknown,		28
Total,		513

SHOE CENTER.

Brockton.

Unskilled industries : —		
Shoe findings,	52	
Miscellaneous (stores, bakeries, shoe stores, etc.),	48	
Messengers,	8	
		108
Low-grade skilled industries : —		
Paper boxes,	21	
Shoe machinery,	8	
Shoe manufacturing,	52	
		81

High-grade skilled industries: —		
Tailors and dressmakers,	3	
Building,	1	
Machinery,	1	
		5
Illegible,		25
Total,		219

JEWELRY CENTER.

Attleborough.

Unskilled industries: —		
Cotton,	36	
Errand boys,	2	
		38
Low-grade skilled industries: —		
Boxes,	2	
Bleachery,	3	
Jewelry,	91	
Wire and metal goods,	2	
		98
High-grade skilled industries: —		
Building,	7	
Machinery,	6	
Printing,	3	
		16
Total,		152

TABLE NO. 4. — *Showing the Industries which Children enter at Various Ages, from Fourteen to Twenty, based on the Lowell, 1905, Census.*

	14 to 15 Years.	16 to 17 Years.	18 to 20 Years.
At work,	1,428[1]	3,029	5,360
At school,	1,696	651	395
Totals,	3,124[2]	3,680	5,755
Mills: —			
Cotton,	448	871	1,460
Woolen (worsted, hosiery, carpet),	400	847	1,234
Totals,	848	1,718	2,694
Unskilled industries: —			
Brushes,	3	–	–
Food products,	–	13	19
Laborers,	60	155	222
Not stated,	102	96	164
Personal service,	50	54	117
Trade,	71	194	453
Totals,	286	512	975
Low-grade skilled industries: —			
Boots and shoes,	29	68	130
Boxes,	12	19	54
Clothing,	11	–	–
Furniture,	–	1	5
Paper and paper goods,	19	13	7
Print works and bleacheries,	16	41	67
Rubber,	–	–	2
Silk and silk goods,	–	3	4
Wooden goods,	–	–	5
Totals,	87	145	274
High-grade skilled industries: —			
Arms,	–	18	22
Apprentices,	32	107	97
Building,	–	9	65
Clothing,	–	36	83
Drugs,	–	2	12
Electropathy,	–	–	2
Electrical apparatus,	–	7	16
Machinery,	22	76	174
Metals,	9	22	45
Musical instruments,	–	4	7
Photography,	–	4	1
Printing, etc.,	–	10	29
Totals,	63	295	553

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[1] Of these, 927 were native born and 501 were foreign born.
[2] Of these, 2,441 were native born and 683 were foreign born.

TABLE NO. 5. — *Showing the Age and Grade at which Children drop out of the Grammar Schools.*[1]

	Grade 9.	Grade 8.	Grade 7.	Grade 6.	Grade 5.	Below Grade 5.	Totals.
At 14 years: —							
Boys,	450	1,164	1,357	1,047	765	591	5,374
Girls,	334	820	1,020	729	444	351	3,698
	784	1,984	2,377	1,776	1,209	942	9,072
At 15 years: —							
Boys,	351	540	350	254	116	71	1,682
Girls,	243	423	314	173	81	60	1,294
	594	963	664	427	197	131	2,976
At 16 years: —							
Boys,	146	147	87	27	47	7	461
Girls,	99	91	58	31	80	8	367
	245	238	145	58	127	15	828
Totals at 14 and 15 years: —							
Boys,	801	1,704	1,707	1,301	881	662	7,056
Girls,	577	1,243	1,334	902	525	411	4,992
	1,378	2,947	3,041	2,203	1,406	1,073	12,048
Totals at 14, 15 and 16 years: —							
Boys,	947	1,851	1,794	1,328	928	669	7,517
Girls,	676	1,334	1,392	933	605	419	5,359
	1,623	3,185	3,186	2,261	1,533	1,088	12,876

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[1] These statistics are based on special reports from school superintendencies, representing 90 per cent. of the population of the State, and from two-thirds of the parochial schools.

TABLE No. 6. — *Showing Numbers graduating from Grammar and High Schools, Numbers entering High Schools, and Numbers going to Work.*[1]

	1901-02.		1902-03.		1903-04.		1904-05.	
Graduating from grammar grades: —								
Boys,	6,305		6,652		6,961		7,102	
Girls,	7,257		8,228		8,515		8,588	
Not segregated,	2,652		2,715		1,614		2,231	
		16,214		17,595		17,090		17,921
Entering high schools: —								
Boys,	4,901		5,116		5,416		5,783	
Girls,	5,853		6,290		6,611		6,867	
Not segregated,	1,578		2,156		2,163		1,566	
		12,332		13,562		14,190		14,216
Graduating from high schools: —								
Boys,	1,685		1,880		2,001		2,183	
Girls,	2,654		3,064		3,185		3,496	
Not segregated,	751		730		788		113	
		5,090		5,674		5,974		5,792
Age and schooling certificates: —								
Boys,	5,313		7,265		6,905		7,302	
Girls,	4,441		5,898		5,996		5,872	
Not segregated,	5,129		5,547		5,598		4,183	
		14,883		18,710		18,499		17,357

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[1] These statistics are based on special reports from school superintendencies, representing 90 per cent. of the population of the State, and from two-thirds of the parochial schools.

TABLE NO. 7. — *Showing Returns from Interviews with Employers concerning the Position of Children in the Industry.*

	Number of Firms visited.	NUMBER OF FIRMS FIRST EMPLOYING CHILDREN AT AGES[1] —			NUMBER OF FIRMS WISHING TO EMPLOY CHILDREN AT AGES —			NUMBER OF FIRMS[2] CONSIDERING EMPLOYMENT OF CHILDREN —		NUMBER OF FIRMS CONSIDERING EDUCATION OF ADVANTAGE TO CHILDREN —		
		14 to 16.	**16 to 18.**	**18+.**	**14 to 16.**	**16 to 18.**	**18+.**	Of Value to Industry.	Of no Value to Industry.	General.	General Industrial.	Special Trade Training.
High-grade Skilled Industries.												
Bicycle chains,	1	1	–	–	1	–	–	–	1	1	1	1
Book binding,	2	–	2	–	–	2	–	–	2	2	–	–
Building trades,[3]	23	–	–	–	–	–	–	–	–	–	–	–
Carriage,	5	–	3	2	–	3	2	–	5	5	5	5
Combs, horn and celluloid,	4	3	1	–	2	1	1	1	3	3	3	3
Electrical apparatus, manufacturing,	5	3	1	1	–	2	3	2	3	5	5	4
Fur,	1	–	–	1	–	–	1	–	1	1	1	1
Glass,	1	–	1	–	–	1	–	1	–	1	1	1
Gloves,	4	–	4	–	–	3	1	1	3	4	4	4
Lamps,	1	–	1	–	–	1	–	–	1	1	1	1
Lithographing,	3	1	1	1	–	2	1	–	3	3	3	3
Machinery,	15	4	5	5	–	4	10	1	13	13	10	9
Manufacturing chemists,	1	1	–	–	–	1	–	1	–	1	–	–
Millinery and dressmaking,	43	13	21	9	11	23	9	8	35	43	17	21
Needles,	1	–	1	–	–	1	–	1	–	1	1	1
Pianos and organs,	5	2	1	2	–	2	3	–	5	5	3	3

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[1] The number actually employed should be noted in Table No. 1, since many firms, especially those of high-grade skilled industries, employ a few children each for errand work.

[2] Twelve of these firms employ no children.

[3] Building trades (23 firms) are reported in the table on apprentices, page 63.

TABLE No. 7. — *Showing Returns from Interviews with Employers, etc.* — Concluded.

	Number of Firms visited.	Number of Firms first employing Children at Ages[1] —			Number of Firms wishing to employ Children at Ages —			Number of Firms[2] considering Employment of Children —		Number of Firms considering Education of Advantage to Children —		
		14 to 16.	16 to 18.	18+.	14 to 16.	16 to 18.	18+.	Of Value to Industry.	Of no Value to Industry.	General.	General Industrial.	Special Trade Training.
Printing and publishing,	5	3	1	1	–	2	3	1	4	5	3	3
Revolvers,	1	–	1	–	–	1	–	–	1	1	1	1
Ship building,	1	1	–	–	–	–	1	–	1	1	1	1
Silk stockings,	1	1	–	–	–	1	–	1	–	–	–	–
Skates,	1	–	1	–	–	1	–	–	1	1	1	1
Straw hats,	9	–	9	–	–	–	9	1	8	4	6	6
Tools,	2	2	–	–	1	–	1	–	2	2	1	1
Watches,	2	2	–	–	–	–	2	–	2	2	–	–
Totals,	137	37	54	22	15	51	47	19	94	105	68	70
Low-grade Skilled Industries.												
Bleaching and dyeing,	2	2	–	–	2	–	–	2	–	1	–	–
Boots and shoes,	33[3]	13	5	2	2	14	5	–	21	16	16	13
Brush manufacturing,	1	–	1	–	–	–	1	1	–	1	1	–
Carpets,	4	4	–	–	2	1	1	3	1	4	1	1
Chairs,	4	4	–	–	–	1	3	–	4	1	1	1
Hosiery and knit wear,	7	5	2	–	2	2	3	2	5	6	3	2
Jewelry,	10	6	4	–	–	8	2	–	10	3	3	3
Leather binding,	2	2	–	–	1	1	–	–	2	1	–	–
Leather tanneries,	8	1	–	7	–	–	7	–	7	3	5	2
Machine operating,	45	11	23	11	3	13	29	4	41	37	24	30

Rubber,	3	2	–	1	1	–	2	1	2	2	2	1
Shirts,	2	2	–	–	–	2	–	–	2	2	1	2
Silk and silk thread,	3	3	–	–	–	3	–	1	2	3	2	2
Wooden boxes,	3	2	–	1	–	2	1	1	2	3	1	1
Woolen and worsted,	14	12	2	1	4	8	1	5	9	10	10	9
Totals,	141	69	37	23	17	55	55	20	108	93	70	67
Unskilled Industries.												
Cans,	1	1	–	–	1	–	–	1	–	1	1	1
Confectionery,	7	6	1	–	3	4	–	7	–	4	1	1
Corks,	1	1	–	–	1	–	–	1	–	–	–	–
Cotton,	24	23	1	–	14	6	4	16	7	24	10	6
Department stores,	6	6	–	–	6	–	–	6	–	4	–	–
Food products,	4	3	1	–	2	2	–	3	1	3	2	1
Games,	3	2	1	–	1	2	–	1	2	3	1	1
Glue,	1	–	–	1	–	–	1	–	1	–	–	–
Messengers,	2	2	–	–	2	–	–	2	–	–	–	–
Paper and paper boxes,	16	11	3	2	1	8	7	4	11	14	6	9
Rivet and stud,	1		1	–	–	1	–	–	1	–	–	–
Thread (cotton),	2	2	–	–	1	1	–	2	–	1	1	1
U. S. fasteners,	1	1	–	–	1	–	–	–	1	–	–	–
Wire goods,	7	6	–	–	–	4	2	4	2	5	2	1
Totals,	76	64	8	3	33	28	14	47	26	59	24	21
Grand totals,	354	170	99	48	65	134	116	86	228	257	162	158

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[1] The number actually employed should be noted in Table No. 1, since many firms, especially those of high-grade skilled industries, employ a few children each for errand work.

[2] Twelve of these firms employ no children.

[3] No returns from 8 of these firms.

TABLE NO. 8. — *Showing Returns from the Investigation of Homes of Children at Work, concerning Family and School History.*

	Number of Firms.	Number of Individuals investigated.	Number of Families represented.	GRADE OF LEAVING SCHOOL.		NUMBER IN EACH GRADE OF HOME, BY RENTS, APPEARANCE, AND INCOME.			Number leaving School from Necessity.	Number beginning Work over 16.	Number of Families expressing Approval of Industrial Education.	ABILITY OF FAMILY TO AFFORD FURTHER SCHOOLING.	
				Number graduated.	Number not graduated.	Good.	Medium.	Low.				Number Possible.	Number Impossible.
High-grade Skilled Industries.													
Glass, . . .	**1**	**130**	**104**	**37**	**93**	**77**	**14**	**1**	**64**	**19**	**54**	**52**	**14**
New Bedford, .	1	130	104	37	93	77	14	1	64	19	54	52	14
Machinery, ...	**8**	**412**	**254**	**153**	**259**	**211**	**76**	**16**	**155**	**125**	**151**	**178**	**30**
Cambridge, Lynn and Worcester, . . .	6	294	159	96	198	127	50	14	104	111	120	112	24
Lowell, .	2	118	95	57	61	84	26	2	51	14	31	66	6
Millinery and dressmaking,	**43**	**54**	**29**	**24**	**30**	**30**	**15**	**1**	**16**	**16**	**20**	**26**	**5**
Cambridge and Boston, .	43	54	29	24	30	30	15	1	16	16	20	26	5
Miscellaneous, . .	–	**36**	**2**	–	–	–	–	–	–	–	–	–	–
New Bedford, ...	–	36	2	–	–	–	–	–	–	–	–	–	–
Pianos and organs, ...	**3**	**94**	**57**	**29**	**65**	**36**	**15**	**2**	**28**	**17**	**53**	**41**	**5**
Cambridge, ...	2	63	34	19	44	15	13	2	23	5	34	26	3
Worcester, . . .	1	31	23	10	21	21	2	–	5	12	19	15	2
Printing and publishing, . .	**3**	**98**	**62**	**46**	**52**	**52**	**44**	**2**	**38**	**27**	**55**	**45**	**4**
Boston and Cambridge,	3	98	62	46	52	52	44	2	38	27	55	45	4
Shipbuilding, ...	**1**	**41**	**23**	**22**	**19**	**8**	**14**	**14**	**21**	–	**16**	**13**	**8**
Quincy, ...	1	41	23	22	19	8	14	14	21	–	16	13	8

Stenographers, etc.,	**–**	**57**	**14**	**44**	**13**	**35**	**20**	**2**	**21**	**27**	**8**	**12**	**2**
Boston and Cambridge,	–	57	14	44	13	35	20	2	21	27	8	12	2
Various trades,	**–**	**127**	**70**	**47**	**80**	**48**	**44**	**12**	**58**	**17**	**59**	**40**	**10**
Boston and Cambridge,	–	127	70	47	80	48	44	12	58	17	59	40	10
Totals,	**59**	**1,049**	**615**	**402**	**611**	**497**	**242**	**50**	**401**	**248**	**416**	**407**	**78**
Low-grade Skilled Industries.													
Boots and shoes,	**18**	**624**	**397**	**147**	**477**	**251**	**213**	**86**	**233**	**133**	**259**	**250**	**88**
Boston,	1	103	60	29	74	24	45	12	48	10	39	41	10
Brockton,	9	179	121	53	126	83	62	22	68	51	106	89	29
Lowell,	1	59	48	22	37	31	20	2	28	2	12	29	8
Lynn and Haverhill,	7	283	168	43	240	113	86	50	89	70	102	91	41
Carpets,	**1**	**77**	**40**	**12**	**65**	**55**	**12**	**1**	**49**	**5**	**19**	**25**	**10**
Worcester,	1	77	40	12	65	55	12	1	49	5	19	25	10
Jewelry,	**9**	**111**	**69**	**34**	**77**	**60**	**22**	**14**	**38**	**20**	**47**	**49**	**10**
Attleborough,	9	111	69	34	77	60	22	14	38	20	47	49	10
Machine operating,	**47**	**271**	**185**	**98**	**173**	**119**	**75**	**28**	**121**	**57**	**61**	**100**	**31**
Boston and Cambridge,	43	108	88	46	62	46	41	17	51	26	41	36	28
Worcester and Springfield,	4	163	97	52	111	73	34	11	70	31	20	64	3
Miscellaneous,	**–**	**469**	**208**	**126**	**343**	**225**	**146**	**19**	**209**	**134**	**86**	**116**	**48**
Holyoke,	–	58	9	10	48	44	14	9	32	9	1	5	3
Lowell,	–	86	47	9	77	29	15	–	16	23	10	14	7
North Adams,	–	109	76	60	49	53	20	–	44	59	22	46	14
Springfield,	–	123	69	13	110	43	60	9	53	23	48	46	23
Worcester,	–	93	7	34	59	56	37	1	64	20	5	5	1
Rubber,	**1**	**75**	**47**	**14**	**61**	**19**	**36**	**16**	**40**	**15**	**33**	**30**	**10**
Cambridge,	1	75	47	14	61	19	36	16	40	15	33	30	10

TABLE NO. 8. — *Showing Returns from the Investigation of Homes of Children at Work, etc.* — Concluded.

	Number of Firms.	Number of Individuals investigated.	Number of Families represented.	GRADE OF LEAVING SCHOOL.		NUMBER IN EACH GRADE OF HOME, BY RENTS, APPEARANCE, AND INCOME.			Number leaving School from Necessity.	Number beginning Work over **16**.	Number of Families expressing Approval of Industrial Education.	ABILITY OF FAMILY TO AFFORD FURTHER SCHOOLING.	
				Number graduated.	Number not graduated.	Good.	Medium.	Low.				Number Possible.	Number Impossible.
Silk and silk thread,	**2**	**246**	**140**	**66**	**180**	**82**	**51**	**31**	**129**	**44**	**101**	**94**	**17**
Florence,	1	141	74	48	93	37	15	20	72	32	53	45	8
Holyoke,	1	105	66	18	87	45	36	11	57	12	48	49	9
Various factories,	–	**228**	**101**	**71**	**157**	**43**	**86**	**44**	**141**	**40**	**81**	**63**	**23**
Cambridge and Boston,	–	228	101	71	157	43	86	44	141	40	81	63	23
Woolen and worsted,	**11**	**269**	**156**	**50**	**219**	**77**	**73**	**36**	**149**	**17**	**47**	**105**	**61**
Holyoke,	2	97	53	8	89	30	17	23	71	7	13	39	14
Lowell,[1]	7	142	81	41	101	41	39	6	61	8	20	52	41
North Adams,	2	30	22	1	29	6	17	7	17	2	14	14	6
Totals,	**89**	**2,370**	**1,343**	**618**	**1,752**	**931**	**714**	**275**	**1,109**	**465**	**734**	**832**	**298**
Unskilled Industries.													
Confectionery and food products,	**7**	**257**	**126**	**58**	**199**	**74**	**98**	**19**	**135**	**70**	**57**	**90**	**23**
Boston, Cambridge and Dorchester,	6	226	100	57	169	68	79	13	114	70	37	77	10
Springfield,	1	31	26	1	30	6	19	6	21	–	20	13	13

Cotton,	**10**	**506**	**278**	**93**	**413**	**137**	**141**	**96**	**263**	**60**	**132**	**162**	**85**
Lowell,	3	97	66	16	81	20	20	7	59	1	19	37	29
New Bedford,	1	82	27	16	66	13	8	7	64	5	12	21	6
North Adams,	3	104	71	18	86	39	38	11	62	16	52	34	24
Taunton,	3	223	114	43	180	65	75	71	78	38	49	70	26
Department stores,	**6**	**368**	**253**	**138**	**230**	**110**	**115**	**60**	**189**	**37**	**80**	**147**	**27**
Boston,	5	314	230	124	190	88	101	55	169	27	61	133	19
Springfield,	1	54	23	14	40	22	14	5	20	10	19	14	8
Heavy work,	–	**119**	**43**	**46**	**73**	**30**	**52**	**19**	**54**	**24**	**27**	**30**	**4**
Cambridge and Boston,	–	119	43	46	73	30	52	19	54	24	27	30	4
Laundries,	–	**26**	**16**	**5**	**21**	**6**	**18**	**2**	**12**	**3**	**2**	**10**	**3**
Cambridge,	–	26	16	5	21	6	18	2	12	3	2	10	3
Messengers,[2]	**2**	**236**	**167**	**61**	**175**	**50**	**52**	**14**	**84**	**19**	**116**	**124**	**33**
Cambridge and Boston,	2	236	167	61	175	50	52	14	84	19	116	124	33
Paper and paper boxes,	**6**	**166**	**104**	**68**	**98**	**97**	**18**	**3**	**51**	**82**	**58**	**65**	**6**
Holyoke,	2	55	7	13	42	7	–	–	29	3	4	7	–
Worcester,	4	111	97	55	56	90	18	3	22	79	54	58	6
Thread (cotton),	**2**	**201**	**106**	**21**	**180**	**82**	**24**	–	**82**	**33**	**51**	**76**	**29**
Boston,	1	26	24	3	23	13	11	–	16	–	7	10	13
Holyoke,	1	175	82	18	157	69	13	–	66	33	44	66	16
Wire goods and rivets,	**7**	**161**	**106**	**49**	**112**	**51**	**57**	**10**	**70**	**32**	**68**	**60**	**26**
Cambridge,	1	37	15	11	26	6	14	2	16	4	10	9	3
Worcester and Quincy,	6	124	91	38	86	45	43	8	54	28	58	51	23
Totals,	**40**	**2,040**	**1,199**	**539**	**1,501**	**637**	**575**	**223**	**940**	**360**	**591**	**764**	**236**
Grand totals,	**188**	**5,459**	**3,157**	**1,559**	**3,864**	**2,065**	**1,531**	**548**	**2,450**	**1,073**	**1,741**	**2,003**	**612**

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[1] Includes carpets and hosiery.

[2] Includes errand and office boys.

TABLE NO. 9. — *Showing Returns from Investigation of the Homes of Children at Work, concerning Wages and Stability in the Industry.*

	Number of Firms.	Number of Children who have been in — Two Firms.	Number of Children who have been in — Three or more Firms.	Number leaving First Employment — In less than Six Months.	Number leaving First Employment — Between Six Months and One Year.	Average Weekly Wage at Successive Ages — 14.	15.	16.	17.	18.	19.	20.
High-grade Skilled Industries.												
Glass,	**1**	**40**	**3**	**16**	**15**	**$3.54**	**$3.84**	**$4.40**	**$5.50**	**$6.95**	**$7.01**	**$8.92**
New Bedford,	1	40	3	16	15	3.54	3.84	4.40	5.50	6.95	7.01	8.92
Machinery,	**8**	**135**	**80**	**42**	**46**	**4.02**	**4.47**	**5.69**	**6.60**	**7.79**	**8.65**	**9.59**
Cambridge, Lynn and Worcester,	6	101	61	35	38	4.07	4.19	5.10	6.20	7.18	8.41	10.03
Lowell,	2	34	19	7	8	3.96	4.78	6.43	6.73	8.24	8.83	9.31
Millinery and dressmaking,	**43**	**19**	**6**	**8**	**4**	**2.50**	**3.22**	**3.93**	**4.33**	**5.25**	**5.50**	**6.68**
Boston and Cambridge,	43	19	6	8	4	2.50	3.22	3.93	4.33	5.25	5.50	6.68
Pianos and organs,	**3**	**31**	**8**	**16**	**13**	**3.78**	**4.10**	**4.67**	**5.23**	**5.91**	**7.05**	**8.77**
Cambridge,	2	16	5	8	8	3.55	3.76	4.46	5.13	5.91	5.50	7.64
Worcester,	1	15	3	8	5	4.66	4.90	5.11	5.43	6.00	8.08	10.12
Printing and publishing,	**3**	**47**	**11**	**7**	**14**	**3.90**	**4.32**	**4.94**	**4.96**	**7.32**	**7.23**	**9.63**
Boston and Cambridge,	3	47	11	7	14	3.90	4.32	4.94	4.96	7.32	7.23	9.63
Shipbuilding,	**1**	**2**	**1**	**12**	**2**	**3.60**	**4.52**	**5.12**	**6.08**	**8.06**	**8.85**	**10.66**
Quincy,	1	2	1	12	2	3.60	4.52	5.12	6.08	8.06	8.85	10.66

Stenographers,	–	**14**	**4**	**7**	**4**	**3.63**	**4.30**	**6.16**	**6.00**	**6.96**	**8.18**	**9.33**
Boston and Cambridge,	–	14	4	7	4	3.63	4.30	6.16	6.00	6.96	8.18	9.33
Various trades,	–	**38**	**18**	**12**	**17**	**3.77**	**4.45**	**4.14**	**6.12**	**5.70**	**7.83**	**10.73**
Boston and Cambridge,	–	38	18	12	17	3.77	4.45	4.14	6.12	5.70	7.83	10.73
Low-grade Skilled Industries.												
Boots and shoes,	**18**	**145**	**64**	**112**	**52**	**3.94**	**4.54**	**5.96**	**6.44**	**7.75**	**8.04**	**8.85**
Boston,	1	29	9	10	7	3.09	3.71	5.05	5.02	6.98	7.25	7.16
Brockton,	9	44	22	63	25	4.34	4.89	6.83	7.28	8.31	9.04	11.25
Lowell,	1	16	4	10	7	3.26	4.71	6.46	8.23	9.50	7.94	7.08
Lynn and Haverhill,	7	56	29	29	13	4.10	4.49	5.62	5.79	7.38	7.94	8.66
Carpets,	**1**	**2**	**4**	**7**	**6**	**3.96**	**4.22**	**4.36**	**5.08**	**5.42**	**8.25**	–
Worcester,	1	2	4	7	6	3.96	4.22	4.36	5.08	5.42	8.25	–
Jewelry,	**9**	**21**	**22**	**19**	**4**	**4.86**	**5.60**	**6.16**	**6.81**	**7.58**	**8.25**	**10.00**
Attleborough,	9	21	22	19	4	4.86	5.60	6.16	6.81	7.58	8.25	10.00
Machine operating,	**45**	**64**	**30**	**63**	**27**	**2.80**	**3.32**	**4.18**	**5.18**	**5.55**	**6.68**	**6.81**
Boston and Cambridge,	41	15	12	14	20	2.75	3.11	4.13	5.10	5.17	6.39	6.50
Worcester and Springfield,	4	49	18	49	7	2.80	3.44	4.20	5.22	5.85	6.85	7.10
Miscellaneous,	–	**142**	**42**	**58**	**38**	**3.90**	**4.51**	**4.70**	**5.94**	**6.94**	**7.44**	**10.04**
Holyoke,	–	21	12	11	4	4.09	4.56	4.92	6.38	6.51	6.30	9.66
Lowell,	–	26	3	6	1	4.00	4.85	4.59	6.90	7.68	10.33	8.96
New Bedford,	–	–	–	–	–	3.60	3.91	4.00	5.22	5.83	6.80	7.33
North Adams,	–	19	3	11	8	4.00	4.65	4.91	5.83	8.13	7.31	11.42
Springfield,	–	50	4	21	16	4.04	4.80	4.65	5.60	6.93	8.03	9.16
Worcester,	–	26	20	9	9	3.50	3.98	4.73	5.71	6.23	6.93	10.50
Miscellaneous factories,	–	**66**	**38**	**59**	**16**	**3.37**	**3.93**	**4.57**	**5.21**	**6.49**	**6.46**	**8.15**
Cambridge and Boston,	–	66	38	59	16	3.37	3.93	4.57	5.21	6.49	6.46	8.15
Rubber,	–	**21**	**19**	**11**	**12**	**3.28**	**3.91**	**4.38**	**6.57**	**5.91**	**8.33**	**8.28**
Cambridge,	–	21	19	11	12	3.28	3.91	4.38	6.57	5.91	8.33	8.28

TABLE NO. 9. — *Showing Returns from Investigation of the Homes of Children at Work, etc.* — Concluded.

	Number of Firms.	Number of Children who have been in —		Number leaving First Employment —		Average Weekly Wage at Successive Ages —						
		Two Firms.	Three or more Firms.	In less than Six Months.	Between Six Months and One Year.	14.	15.	16.	17.	18.	19.	20.
Silk and silk thread,	**2**	**36**	**5**	**17**	**1**	**3.45**	**4.38**	**5.07**	**5.66**	**6.55**	**6.83**	**8.46**
Florence,	1	5	1	–	1	3.44	4.63	4.90	5.59	6.14	7.03	8.67
Holyoke,	1	31	4	17	–	3.45	4.15	5.31	5.72	7.05	6.69	7.66
Woolen and worsted,	**11**	**45**	**8**	**57**	**21**	**4.17**	**4.71**	**5.73**	**6.38**	**9.19**	**7.87**	**10.30**
Holyoke,	2	23	5	14	6	4.28	4.88	5.55	6.65	7.18	8.12	8.33
Lowell,[1]	7	20	3	42	15	4.05	4.53	5.96	6.21	7.23	7.50	11.50
North Adams,	2	2	–	1	–	4.28	5.23	5.20	7.30	7.83	8.00	8.00
Unskilled Industries.												
Confectionery and food products,	**7**	**55**	**34**	**44**	**31**	**3.01**	**3.38**	**4.44**	**4.93**	**5.48**	**5.82**	**6.00**
Boston, Cambridge and Dorchester,	6	38	29	31	25	3.11	3.34	4.73	4.98	5.48	5.82	6.00
Springfield,	1	17	5	13	6	2.80	3.46	4.31	4.00	–	4.00	–
Cotton,	**10**	**70**	**19**	**54**	**105**	**3.83**	**4.66**	**5.75**	**6.15**	**6.81**	**6.83**	**7.60**
Lowell,	3	19	13	18	24	3.86	4.78	5.64	6.37	6.43	6.76	5.50
New Bedford,	3	16	1	4	5	3.80	4.54	5.67	6.52	6.91	7.38	9.00
North Adams,	1	6	1	22	68	3.84	4.77	5.76	5.91	6.99	6.27	7.75
Taunton,	3	29	4	10	8	3.82	4.58	5.37	6.11	6.80	6.91	7.32

Department stores,	**6**	**86**	**74**	**123**	**37**	**2.69**	**3.26**	**3.60**	**4.27**	**5.34**	**5.53**	**6.69**
Boston,	5	72	66	111	36	2.69	3.26	3.62	4.18	5.33	5.36	6.54
Springfield and Worcester,	1	14	8	12	1	2.62	3.19	3.45	5.07	5.50	5.93	7.40
Heavy work,	–	**44**	**19**	**14**	**19**	**3.27**	**4.77**	**4.90**	**5.51**	**7.13**	**8.18**	**10.11**
Cambridge and Boston,	–	44	19	14	19	3.27	4.77	4.90	5.51	7.13	8.18	10.11
Laundries,	–	**13**	**1**	**3**	**3**	**3.25**	**3.85**	**4.31**	**4.86**	**4.91**	**4.91**	**6.00**
Cambridge,	–	13	1	3	3	3.25	3.85	4.31	4.86	4.91	4.91	6.00
Messengers,[2]	**2**	**59**	**27**	**47**	**20**	**3.39**	**3.97**	**4.32**	**5.59**	**5.92**	**7.45**	–
Boston,	2	59	27	47	20	3.39	3.97	4.32	5.59	5.92	7.45	–
Paper and paper boxes,	**6**	**67**	**20**	**59**	**52**	**4.05**	**4.67**	**5.02**	**5.50**	**6.36**	**6.57**	**6.76**
Holyoke,	2	23	1	4	7	4.67	5.40	6.49	6.71	6.87	7.57	7.52
Worcester,	4	44	19	55	45	3.16	4.29	4.40	5.15	6.17	6.20	6.00
Thread,	**2**	**20**	**8**	**15**	**4**	**3.78**	**4.91**	**5.25**	**6.25**	**6.88**	**7.01**	**6.50**
Boston,	1	4	1	6	1	3.10	4.64	4.92	5.45	–	–	–
Holyoke,	1	16	7	9	3	3.90	4.94	5.47	6.41	6.88	7.01	6.50
Wire goods and rivets,	**7**	**35**	**18**	**22**	**19**	**3.43**	**3.96**	**5.06**	**5.66**	**6.24**	**7.03**	**7.27**
Cambridge,	1	8	3	5	3	2.95	4.02	5.18	6.58	6.64	6.66	6.90
Worcester and Quincy,	6	27	15	17	16	3.55	3.98	5.02	5.41	6.03	7.22	7.58

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[1] Includes carpets and hosiery.

[2] Includes errand and office boys.

TABLE No. 10. — *Showing the Weekly Income at Successive Ages from Fourteen to Twenty, based on Investigation of Families.*

	Number of Children earning a Weekly Wage of —																
	$2 to $2.50.	$2.50 to $3.	$3 to $3.50.	$3.50 to $4.	$4 to $4.50.	$4.50 to $5.	$5 to $5.50.	$5.50 to $6.	$6.	$7.	$8.	$9.	$10.	$11.	$12.	$12+	Total considered.
High-grade Skilled Industries.[1]																	
Glass: —																	
At fourteen years of age,	3	1	6	2	6	–	–	–	1	1	–	–	–	–	–	–	20
At fifteen years of age,	1	1	10	5	15	–	1	–	2	1	–	–	–	–	–	–	36
At sixteen years of age,	–	–	5	5	14	1	7	2	4	–	1	–	–	–	–	–	39
At seventeen years of age,	–	–	–	2	9	1	5	1	5	1	3	–	2	–	–	–	29
At eighteen years of age,	–	–	–	–	4	2	2	2	4	2	4	–	4	–	2	–	26
At nineteen years of age,	–	–	–	–	2	2	2	2	1	3	5	3	2	–	–	–	22
At twenty years of age,	–	–	–	–	–	–	1	–	1	3	2	–	4	–	1	1	13
Totals,	4	2	21	14	50	6	18	7	18	11	15	3	12	–	3	1	185
Pianos: —																	
At fourteen years of age,	–	1	4	1	4	2	2	–	–	–	–	–	–	–	–	–	14
At fifteen years of age,	1	1	7	4	10	–	5	–	4	1	–	–	–	–	–	–	33
At sixteen years of age,	–	–	1	1	7	3	7	1	2	1	–	–	–	–	–	–	23
At seventeen years of age,	–	–	2	1	2	5	7	–	6	1	1	–	1	–	–	–	26
At eighteen years of age,	–	–	–	–	2	3	2	1	6	1	2	–	1	–	–	–	18
At nineteen years of age,	–	–	–	–	–	–	2	–	4	1	–	1	2	–	–	–	10
At twenty years of age,	–	–	–	–	–	1	2	–	1	–	–	2	3	–	1	1	11
Totals,	1	2	14	7	25	14	27	2	23	5	3	3	7	–	1	1	135

Printing and publishing: —																	
At fourteen years of age,	1	4	5	5	5	2	1	–	1	1	–	1	–	–	–	–	26
At fifteen years of age,	–	1	6	1	6	1	–	–	–	1	–	–	–	–	–	–	16
At sixteen years of age,	1	1	9	1	7	3	8	–	3	2	4	1	1	–	1	–	42
At seventeen years of age,	–	–	1	5	5	4	7	1	7	1	2	–	–	–	–	–	33
At eighteen years of age,	–	1	–	–	–	1	2	1	5	3	–	–	1	1	1	1	17
At nineteen years of age,	–	–	–	–	1	–	3	–	2	3	4	2	2	–	–	–	17
At twenty years of age,	–	–	–	–	–	–	2	–	1	1	2	1	3	–	–	3	13
Totals,	2	7	21	12	24	11	23	2	19	12	12	5	7	1	2	4	164
Low-grade Skilled Industries.																	
Boots and shoes: —																	
At fourteen years of age,	3	5	53	10	29	6	14	1	14	2	–	2	–	–	–	–	139
At fifteen years of age,	6	2	42	9	30	4	29	1	38	11	2	1	–	–	–	–	175
At sixteen years of age,	1	–	19	1	21	6	22	3	51	23	20	11	5	–	2	–	185
At seventeen years of age,	–	–	9	–	15	6	25	2	31	26	14	12	2	3	5	2	152
At eighteen years of age,	1	1	–	6	–	12	6	16	18	18	18	9	–	5	5	1	116
At nineteen years of age,	–	–	–	–	3	–	6	2	10	12	8	4	7	1	9	2	64
At twenty years of age,	–	–	–	–	2	–	–	–	6	4	4	7	3	–	5	5	36
Totals,	11	8	123	26	100	34	102	25	168	96	66	46	17	9	26	10	867
Jewelry: —																	
At fourteen years of age,	1	–	1	–	4	8	5	–	2	–	–	–	–	–	–	–	21
At fifteen years of age,	1	–	2	–	–	5	1	7	3	4	1	–	–	–	–	–	24
At sixteen years of age,	–	–	–	–	2	6	–	11	6	9	–	1	2	–	1	–	38
At seventeen years of age,	1	–	–	–	–	2	1	5	8	4	2	1	–	–	11	–	35

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[1] For similar tables, see pp. 68, 69; 82–84.

TABLE NO. 10. — *Showing the Weekly Income at Successive Ages, etc.* — Continued.

	NUMBER OF CHILDREN EARNING A WEEKLY WAGE OF —																
	$2 to $2.50.	$2.50 to $3.	$3 to $3.50.	$3.50 to $4.	$4 to $4.50.	$4.50 to $5.	$5 to $5.50.	$5.50 to $6.	$6.	$7.	$8.	$9.	$10.	$11.	$12.	$12 +.	Total considered.
Jewelry — *Concluded.*																	
At eighteen years of age,	–	–	1	–	–	–	2	3	4	4	2	2	1	1	11	–	31
At nineteen years of age.	–	–	–	–	–	1	–	–	2	7	1	1	–	1	–	–	13
At twenty years of age,	–	–	–	–	–	–	–	1	–	3	1	–	1	–	–	3	9
Totals,	3	–	4	–	6	22	9	27	25	31	7	5	4	2	23	3	171
Rubber: —																	
At fourteen years of age,	–	1	9	2	4	–	–	–	–	–	–	–	–	–	–	–	16
At fifteen years of age,	1	2	3	2	4	3	4	–	3	–	–	–	–	–	–	–	22
At sixteen years of age.	1	–	4	2	1	3	2	–	5	–	–	–	–	–	–	–	18
At seventeen years of age,	–	–	1	1	–	2	–	2	–	2	2	2	–	–	–	–	12
At eighteen years of age,	–	–	1	1	–	1	–	–	–	1	1	1	–	–	–	–	6
At nineteen years of age,	–	–	–	–	–	–	–	–	2	2	2	7	2	–	–	–	15
At twenty years of age,	–	–	–	–	–	–	–	–	4	–	2	2	–	–	–	–	8
Totals,	2	3	18	8	9	9	6	2	14	5	7	12	2	–	–	–	97
Silk: —																	
At fourteen years of age,	2	5	38	17	9	3	7	–	1	–	–	–	–	–	–	–	82
At fifteen years of age,	4	1	13	12	7	7	5	6	7	2	1	–	–	–	–	–	65

At sixteen years of age,	1	–	10	1	1	4	10	8	15	3	3	–	–	–	–	–	56
At seventeen years of age,	–	–	5	1	1	–	7	6	14	1	5	1	–	–	–	–	41
At eighteen years of age,	1	–	1	–	–	–	2	10	15	6	6	1	3	–	1	–	46
At nineteen years of age,	–	–	–	–	1	–	3	3	9	4	7	4	–	–	–	–	31
At twenty years of age,	–	–	–	–	–	–	1	1	1	3	3	1	2	1	1	–	14
Totals,	8	6	67	31	19	14	35	34	62	19	25	7	5	1	2	–	335
Woolen: —																	
At fourteen years of age,	4	–	20	15	46	20	14	1	6	1	–	–	–	–	–	–	127
At fifteen years of age,	–	2	16	5	26	45	23	9	11	4	–	–	–	–	–	–	141
At sixteen years of age,	–	–	6	1	15	18	14	3	10	4	2	2	–	–	–	–	75
At seventeen years of age,	–	–	2	3	2	8	5	5	10	7	4	1	–	–	–	–	47
At eighteen years of age,	–	–	–	–	1	3	6	3	7	8	6	3	1	1	1	–	40
At nineteen years of age,	–	–	–	–	–	–	1	1	5	5	2	1	2	–	3	–	20
At twenty years of age,	–	–	–	–	1	–	–	–	–	–	2	3	–	2	3	–	11
Totals,	4	2	44	24	91	94	63	22	49	29	16	10	3	3	7	–	461
Unskilled Industries.																	
Cotton: —																	
At fourteen years of age,	4	1	49	22	24	6	16	4	6	–	–	–	–	–	–	–	132
At fifteen years of age,	4	3	19	12	37	7	33	13	18	4	2	1	1	–	–	–	154
At sixteen years of age,	–	–	5	3	12	9	25	7	30	19	4	–	–	–	–	–	114
At seventeen years of age,	–	–	3	1	3	4	11	10	21	18	9	3	–	–	–	–	83
At eighteen years of age,	–	–	–	1	–	1	8	–	24	20	10	4	1	–	–	–	69
At nineteen years of age,	–	–	–	–	–	1	8	–	16	11	5	4	1	–	–	–	46
At twenty years of age,	–	–	–	–	1	–	1	–	5	8	6	4	4	–	–	–	29
Totals,	8	4	76	39	77	28	102	34	120	80	36	16	7	–	–	–	627

TABLE No. 10. — *Showing the Weekly Income at Successive Ages, etc.* — Concluded.

	NUMBER OF CHILDREN EARNING A WEEKLY WAGE OF —																
	$2 to $2.50.	$2.50 to $3.	$3 to $3.50.	$3.50 to $4.	$4 to $4.50.	$4.50 to $5.	$5 to $5.50.	$5.50 to $6.	$6.	$7.	$8.	$9.	$10.	$11.	$12.	$12+.	Total considered.
Confectionery: —																	
At fourteen years of age,	3	7	31	6	4	1	1	–	–	–	–	–	–	–	–	–	53
At fifteen years of age,	1	4	27	14	6	1	–	–	2	1	–	–	–	–	–	–	56
At sixteen years of age,	–	–	6	7	5	4	12	–	6	–	–	–	–	–	–	–	40
At seventeen years of age,	1	3	2	7	3	37	1	7	1	–	–	–	1	–	–	–	63
At eighteen years of age,	–	–	–	–	4	–	22	–	16	–	1	–	–	–	–	–	43
At nineteen years of age,	–	–	1	1	1	–	12	–	13	1	1	1	–	–	–	–	31
At twenty years of age,	–	–	–	–	1	–	4	2	5	1	–	–	–	–	–	–	13
Totals,	5	11	67	35	24	43	52	9	43	3	2	1	1	–	–	–	299
Department stores: —																	
At fourteen years of age,	28	95	31	9	7	–	2	–	2	–	–	–	–	–	–	–	174
At fifteen years of age,	16	41	41	13	11	4	7	–	2	–	–	–	–	–	–	–	138
At sixteen years of age,	6	17	21	17	13	2	8	–	7	–	2	–	–	–	–	–	93
At seventeen years of age,	3	3	14	5	13	5	9	–	4	3	2	–	2	–	–	–	63
At eighteen years of age,	1	–	3	3	10	1	6	–	6	5	3	1	–	–	1	–	40
At nineteen years of age,	–	–	–	1	3	4	8	1	5	3	–	1	–	1	–	–	27
At twenty years of age,	–	–	1	–	3	–	5	1	7	3	2	1	3	–	2	–	28
Totals,	54	159	111	48	60	16	45	2	33	14	9	3	5	1	3	–	563

Messengers: —																	
At fourteen years of age,	4	5	50	12	21	–	4	–	–	–	–	–	–	–	–	–	96
At fifteen years of age,	2	3	25	18	35	1	13	–	7	3	1	–	–	–	–	–	108
At sixteen years of age,	–	4	13	6	21	4	5	–	10	2	1	–	1	–	–	–	67
At seventeen years of age,	–	–	2	1	7	3	8	–	5	3	1	2	–	–	1	–	33
At eighteen years of age,	–	–	1	–	2	–	4	–	2	–	3	–	1	–	–	–	13
At nineteen years of age,	–	–	–	–	1	1	2	–	1	2	2	–	1	–	–	–	10
At twenty years of age,	–	–	–	–	1	1	1	–	1	–	–	1	–	–	–	–	5
Totals,	6	12	91	37	88	10	37	–	26	10	8	3	3	–	1	–	332
Paper: —																	
At fourteen years of age,	1	2	5	1	6	–	3	4	–	–	–	–	–	–	–	–	22
At fifteen years of age,	2	–	6	2	2	–	4	1	8	2	–	–	–	–	–	–	27
At sixteen years of age,	3	2	8	4	10	–	5	–	10	3	5	–	–	–	–	–	50
At seventeen years of age,	–	–	2	2	8	2	7	–	7	5	2	–	–	–	1	–	36
At eighteen years of age,	–	–	–	3	2	1	5	–	13	2	5	1	2	1	–	–	35
At nineteen years of age,	–	1	3	–	2	–	4	–	10	8	7	5	1	–	–	–	41
At twenty years of age,	–	–	1	–	1	–	–	–	3	1	2	1	1	–	–	–	10
Totals,	6	5	25	12	31	3	28	5	51	21	21	7	4	1	1	–	221

TABLE No. 11. — *Showing the Financial Statement and Courses of Study of Representative Trade and Technical Schools of Various Types, selected from the Cities of the United States.*

	Endowment or Support.	Value of Land and Buildings.	Value of Equipment.	Annual Expenses.	Cost per Pupil.	Number of Pupils.	Fees.
Textile Schools.							
Lowell (male and female). Three-quarters of Board of Trustees connected with textile industries.	State, $25,000; city, $8,000; tuition, $11,847; deficit, $471.26.	Land, $87,270.09; building (donated), $232,350.20.	$158,914 49	1905, $45,318.26.	$62 16+	Day 141; evening, 588.	Day, $100 (non-residents of State, $150).
New Bedford (male), . . .	State, $146,000; city, $61,000; citizens, $7,000; total, $214-000.	Land, $21,800; building, $51,850.	$41,772 20	Maintenance, $19,002.38; construction, $1,350; equipment, $472.20; total, $20,824.58.	- -	- -	Day, $100 (non-residents of State, $150); evening, $2.50 per subject.
Fall River, Bradford-Durfee Textile School.	Loan, $50,000; city, $15,000; State, $18,000; tuition, $1,081; other sources, $1,084.74.	Construction, $90,471.24; land (donated), $33,449.08.	$43,438 45	$22,168 33	- -	1904-05, day, 8; evening, 146.	Day, $100 (non-residents of State, $150); evening, free (non-residents, $250 per term).
Advanced Technical Schools.							
Philadelphia, Drexel Institute (male and female).	Endowment, $3,000,000.	$2,000,000 (includes equipment).	- -	$140,000 00	$75 00	- -	- -
Brooklyn, Pratt Institute (male and female).	Endowment, $2,500,000.	$1,200,000 (includes equipment).	- -	$250,000 00	$30 00	1904-05, 3,405.	- -
Secondary and Advanced Technical Schools.							
Peoria, Ill., Bradley Polytechnic.	$200,000 (including interest on investments).	- -	- -	$45,000 00	$120 00	500	School of Horology, $20 per month first three months, $10 per month thereafter; optics (if enrolled in other departments), $10; optics alone, $25.

Secondary Technical Schools.							
Chicago, Lewis Institute (male and female), opened 1896.	$1,600,000 (incorporated); tuition, $14,000.	Land, $169,000; buildings, $400,000.	$150,000 00	$114,000 00	$40 00	Day, 1,245; evening, 1,052.	Day, $10 per course; evening, $5 for ten-week term, two evenings per week.
Boston, Mechanics Arts High (male).	Municipal.	$310,000 (includes equipment).	- -	- -	- -	1895, 160; 1905, 493.	Non-residents, $85.
Springfield, Mechanics Arts High (male and female).	City, $6,600.	Old building (rented), $3,000; new building, $195,000.	Old building (initial), $8,000; additional, $20,000.	$9,956.17 (first year, 1898).	$125 00	1905-06, day, 223.	- -
St. Louis, Manual Training School of Washington University (male).	Managing board under corporation of university.	Donated.	Donated.	$3,000 a year was given first five years.	- -	- -	One year, $100; two years, $120; three years, $140; four years, $150.
Baltimore, Polytechnic (1884),	Municipal.	$90,000 00	$40,000 00	$45,000 00	$72 00	600	Free (non-residents), $72.
Brookline, Manual Training, .	Municipal.	$100,000 (appropriated).	$30,000 (appropriated).	1903, $15,249. Supplies, Domestic Arts, $465; supplies, Manual Training, $1,008.75.	- -	- -	- -
Trade Schools, Long Course.							
Williamson, Pa., Free Trade School (male).	Endowment, $2,000,000.	$500,000 (includes equipment).[1]	- -[2]	$100,000 00	$400 (including board and instruction; material, $25; salaries, power, lights, etc., $75).	210	Free.
San Francisco, California School of Mechanical Arts (male and female).	Endowment, $540,000.	Land, $43,825.82; building, $59,895.07.	$38,327 04	1904-05, — $23,594.88.	$56 04	1903-04, boys, 342; girls, 79; total, 421.	Free (tuition).
San Francisco, Wilmerding, opened 1900, (male).	Endowment, $434,000.	Land, $28,564.12; buildings, $40,080.38.	$22,504 82	$20,000 00	- -	1903-04, 186.	Free.

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[1] Shop No. 1, machine, tool, and carpenter, $14,000; Shop No. 2, pattern making and elementary brick laying, $14,000; Shop No. 3, advanced brick laying and chemical laboratory, $16,000.

[2] Shop No. 1, machine, $15,000, carpenter, $3,000; Shop No. 2, pattern, $5,000, brick laying, $500; Shop No. 3, $1,000.

TABLE NO. 11. — *Showing the Financial Statement and Courses of Study, etc.* — Concluded.

	Endowment or Support.	Value of Land and Buildings.	Value of Equipment.	Annual Expenses.	Cost per Pupil.	Number of Pupils.	Fees.
Rochester, Athenæum (male and female).	Citizens, $29,000.	– –	$7,000 00	$43,325 (one-half expense day classes covered by tuition).	– –	2,284 (day and evening).	Day, $10 (three months' term); evening, $10 to $18 (seven months); domestic science, $26.
Winona, Ind., Technical Institute (male).	Citizens, $500,000.	Buildings: lithographing, $12,000; printing, $40,000; power, heat, etc., $60,000.	– –	1905, $25,000.	– –	91	– –
Trade Schools, Short Course.							
New York, Trade School (male),	Philanthropic.	$350,000 (includes equipment).	– –	$40,000 (one-half current expenses covered by tuition).	$65 00	Day, 274; evening, 503; total, 777.	$40 00
New York, Baron de Hirsch (male).	Philanthropic.	$175,000 (includes equipment).	– –	$40,000 00	$180 00	156	Free.
New York, Manhattan Trade School (female).	Philanthropic; sale of work, $2,533.95.	$2,100 00	$3,962 03	$22,937 14	$168 62	121	Free.
Boston, Trade School for Girls,	Philanthropic; sale of work, $2,177.81.	Rent, $174.99.	$935 72	$6,455 00	$150 00	1904-05, 60.	Free.
Philadelphia, B'Nai B'Rith Manual Training.	Philanthropic.	– –	$1,200 00	$6,500 00	– –	10 public school classes, 350; 4 intermediate, 52; 5 trade, 97.	– –

Trade Schools, Short and Long Course.							
Philadelphia, Spring Garden Institute (male and female).	Private.	$150,000 to $200,-000.	$30,000 00	$24,644 72	- -	1903-04, day, 75; night, 920.	Mechanics, day, $25 term, first year; $30 term, second and third years; evening, $5 term. Drawing, evening, $5 (6 mos. term); day, $20 (nineteen-week term).
Evening Trade Schools.							
Springfield, Evening School of Trade (use of buildings of Springfield Mechanics Arts High).	Municipal.	- -	- -	- -	$0 60 per week.	1905, 252.	Free ($5 for materials).
Newark, Technical School, .	Municipal; State subsidy, $3,000 to $5,000.	$100,000	$20,000 00	$13,530 43	$40 (average).	319	Free to residents of Newark; $6 to $15 per term, special students.

REQUIREMENTS FOR ENTRANCE, LENGTH OF COURSE, AND COURSES OF STUDY OFFERED IN ABOVE SCHOOLS.

Textile Schools.

Lowell Textile School.—Qualification for entrance: day, high school graduate; evening, grammar school education. Day course, three years: cotton and wool manufacturing, decorative art, textile design, chemistry, dyeing, textile engineering. Evening course: cotton, woolen, worsted, spinning, weaving, designing, chemistry, dyeing, mechanical engineering.

New Bedford Textile School.—Cotton manufacture.

Fall River Textile **School.**—Qualification for entrance: day, seventeen years of age, high school graduate, or on examination; evening, seventeen years of age.

Advanced Technical Schools.

Drexel Institute, Philadelphia, Pa.—Day course: architecture, science and technology, commerce and finance, domestic science, domestic arts, library, English language and literature, physical training. Evening course: choral music.

Pratt Institute, Brooklyn, N. Y.—Qualification for entrance: day, sixteen years of age. Day and evening courses: fine and applied art, domestic science, science and technology, kindergarten, library school, gymnasium.

Secondary and Advanced Technical Schools.

Bradley Polytechnic, Peoria, Ill.—Qualification for entrance: grammar graduate or examination. Academic course, six years,—two years of college: engineering, classics, literature, mechanics arts, or combination group. School of Horology: elementary watch work, engraving, finishing, jewelry, optics. Teachers' course in manual training and domestic economy.

Carnegie Technical Schools, Pittsburg, Pa.—Qualification for entrance: sixteen years of age, or pass academic examination. *School of Applied Science:* day course, three years: architectural, civil, chemical, electric railway, motor power, foundry, and mechanical practice. Evening courses: machine work, pattern making, blacksmithing, moulding and foundry work, plumbing, sheet metal and cornice work, electric wiring, brick laying, sign painting. *School for Apprentices and Journeymen* (preference given to those employed at a trade). *Technical School for Women. School of Applied Design:* Advanced night courses in architectural drawing and design.

School of Applied Art, Philadelphia, Pa.—Qualification for entrance: completed grammar grades or equivalent. Day course, six hours, five days a week: drawing, applied design, normal art institute, wood work and carving, decorative painting, illustration, decorative sculpture, architectural drawing and design, metal work, pottery. *Textile School:* fabric structure and design, cotton, wool, worsted and silk, warp preparation and weaving, color harmony and figure design, chemistry, dyeing and printing, wool yarn manufacturing, worsted yarn manufacturing, cotton yarn manufacturing, hosiery, knitting, finishing. *School of Modern Languages:* Course, two hours, three evenings a week: art, architecture, drawing, building construction.

Secondary Technical Schools.

Lewis Institute, Chicago, Ill.—Qualification for entrance: completed grammar grades or examination. *School of Arts* (including domestic economy). *School of Engineering:* courses: wood, pattern foundry, forge and machine, drawing, design, mathematics, electric and mechanical engineering.

Ohio Mechanics Institute, Cincinnati, O.—Qualification for entrance: completed grammar grades or examination. Courses: technical high school, school of mechanics, school of architecture, school of science, school of industrial or applied art.

Mechanics Arts High, Springfield.—Qualification: graduation from grammar grades. Two courses in manual training; one course preparatory to technical colleges.

Mechanics Arts High, Boston.—Qualification for entrance: grammar school graduate. First three years all students take same course; fourth year, shop work or higher technical preparatory.

Manual Training School, Washington University, St. Louis, Mo.—Qualification for entrance: fourteen years of age, and completed grammar grades. Course: four years manual and mental training.

Baltimore Polytechnic, Baltimore, Md.—Qualification for entrance: completed grammar grades, or pass examination based thereon. Course: four years. General course until the last year, when the student specializes. Courses are preparatory to mechanical, civil and electrical engineering.

Northeast Manual Training School, Philadelphia, Pa.—Qualification for entrance: completed grammar grades, or pass examination. Courses, three years: drawing, one period each day; shop work, two periods each day; regular academic studies, three periods each day.

Trade Schools, Long Course.

Williamson Free Trade School, Pennsylvania.—Qualification for entrance: boys, sixteen to eighteen years of age; pass scholastic, moral and physical examination; native of United States. The student is bound as an indentured apprentice to the trustees for three years. Course, eight hours daily, five days a week: carpentry, brick laying, including range, boiler and furnace setting, machine trade, pattern making, steam and electrical engineering, steam fitting. Academic work is required in all courses.

California School of Mechanical Arts.—Qualification for entrance: grammar school graduate. Preliminary manual training course, two years; select one of twelve technical courses for remaining two years. Some work in history, geography, mathematics and science. Technical courses: pattern and model making, forge work, moulding, machine shop work, electrical construction, machine and ship drawing, industrial art and chemistry, cookery, dressmaking, millinery.

Preparatory for Technical College, Polytechnic Course.

Wilmerding School, San Francisco, Cal.—Qualification for entrance: boys who have completed grammar grades; if over sixteen, required to have completed seventh grade. Course, first and second years: four periods a day shop work, and four periods a day instruction in English branches. Third and fourth years, academic work discontinued gradually. Boy may begin his apprenticeship when he enters the school, or defer his choice for two years. Trades offered: carpentry, plumbing, cabinet making, electrical work, brick laying, blacksmithing, wood carving, clay modeling, architectural drawing.

Rochester Athenæum, Rochester, N. Y.—Qualification for entrance: day, grammar school education. Industrial arts course, three terms of three months each: mechanical and free-hand drawing, machine design, steam and gas engineering, statics, surveying, lettering. Mechanics arts and science course, day, three years. Manual training course, evening, two years: wood work, iron work. Domestic science and art course, three terms, three months each: cookery, waitress and housemaid course, physiology, chemistry, laundry, sewing, dressmaking, embroidery, millinery, physical culture. Fine arts: normal course in domestic science and art.

Winona Technical Institute, Indianapolis, Ind.—School of lithography, school of printing, school of building trades: two courses, nine months each, for carpentry and for house, sign and decorative painting.

Trade Schools, Short Course.

New York Trade School, New York, N. Y.—Day course: plumbing, house, sign and fresco painting, cornice and skylight work, pattern drafting, brick laying, plastering, carpentry, steam fitting, electrical work. Evening course: brick laying, plastering, plumbing, electrical work, pattern making, house, sign, and fresco painting, steam fitting, blacksmithing, tile laying, cornice and skylight work, printing.

Baron de Hirsch, New York, N. Y.—Qualification for entrance: fifteen to eighteen years of age, boys. Course: machinery, carpentry, plumbing, painting, electrical work.

Clara de Hirsch, New York, N. Y.—Qualification for entrance: fourteen to seventeen years of age, girls. Course: hand sewing, four to six months; millinery, six months; dressmaking, one and one-half years.

Manhattan Trade School, New York, N. Y.—Qualification for entrance: fourteen years of age, girls. Term, twelve months. Courses: art, machine operating, dressmaking, millinery, pasting, academic work.

Boston Trade School for Girls, Boston.—Qualification for entrance: fourteen to seventeen years of age. Courses: design, hand sewing, dressmaking, machine operating, millinery, gymnastics and domestic science.

B'Nai B'Rith Manual Training, Philadelphia, Pa.—Every boy, eleven to fourteen years old, in fifth, sixth, seventh grade of the Mt. Vernon (public school), has one and one-half hours per week manual training. Four intermediate classes, one hour two afternoons a week; seven trade classes, two evenings a week. Pattern making, moulding, electric wiring, mechanical drawing.

Appendix No. 1.

INDUSTRIAL EDUCATION IN EUROPE.

England.

In 1889 an act was passed in Great Britain, called the "Technical Instruction Act," which permitted local authorities to levy a tax of a "penny in the pound" for technical education in England. In addition, the local authorities receive considerable revenue from what is known as the residue grant, or the customs and excise grant. The grant for the city of Manchester amounted to about £12,000 per annum, and by further legislation in 1903 it was made an absolute annual grant from the national exchequer to all those local bodies forever for technical and industrial training. It is no longer optional; they are bound to give it to technical and industrial training. London, however, receives more funds for technical education from the guilds and old charities than do other parts of England.

Over forty so-called technical institutions and polytechnics of considerable size are now flourishing and steadily growing in England and Scotland, while there are many smaller ones, and new institutions being started yearly.

Character and Extent.

It is not sought to teach the practice of any trade or industry, but rather to supplement such practice with instruction in the art or science of principles applicable to specific industries, among which may be mentioned wood carving, engraving, inlaying, metal chasing, enameling, china painting, embroidering, artificial flower making. Other subjects in the technical schools are physics, engineering, — steam and electrical, — building trades, metal trades, chemistry, textile engineering, manual training, commercial training, etc. There are also maintained instruction classes for women in cookery, dress cutting and making, and other domestic branches. Nearly every institution maintains day and evening sessions.

Fees.

The fees charged for tuition are very reasonable, depending in many cases upon the circumstances of the student. In the evening classes, for instance, many schools regulate their fees to correspond with the amount of money earned by the students at their work during the day.

Qualifications of Teachers.

Teachers of the workshop classes are found to require three qualifications: first, practical familiarity with the work taught, such as best can be acquired by holding a position as foreman in some first-class establishment; second, a knowledge of most of the scientific and art principles applicable to the work taught, and such as can be acquired in the best technical institutes; third, natural ability as teachers. In many cases it has been found very difficult to combine these qualities, but it is becoming less so with the age of the institutes. Some of the teachers in the evening classes continue to practise their trade by day. Where that is not done, special care must be exercised by the teacher to keep in touch with the latest progress of workshop practice.

Qualifications of Students.

While in general no specific examinations relative to the admission of students are insisted upon, except perhaps in the higher branches of technical education, yet the applicants must possess sufficient qualifications to enable them to successfully carry on the work of the schools. The minimum age at which a student may enter is, in most cases, fourteen years, although there are one or two institutions which allow boys to enter at nine years of age.

Obstacles.

There are some obstacles necessarily met with in installing an innovation of this kind, such as the indifference of employers to the progress of technical education; but this indifference is being gradually overcome, many employers being greatly in favor of technical education, and striving to stimulate it by offering prizes for excellence in studies and paying in whole or in part the fees of their workmen at the trade. Employers, though, are realizing more and more the importance of technical education, and prefer school-trained apprentices, paying such better wages than they would receive were they not so trained. The most serious obstacle, however, is due to the poor general education of the English workman.

Benefits.

The student is benefited as man by securing a better education. Where trade-union restrictions are strong, or where the apprenticeship system prevails, he may not earn full journeyman's wages until twenty-one, no matter how competent he may be at an early age through natural ability or work in the technical classes, but after twenty-one he may advance rapidly to high industrial position; and in the large number of industries where these restrictions do not prevail the student will find his financial position soon improved through proficiency obtained in the technical classes.

Aside from the improvement of the workman, two other benefits are widely noted. One is the greater appreciation by the purchasing public of the good quality of goods and of the artistic side of house furnishing, — mediæval castings, ornamental brickwork, enameling, etc. The other advantage most widely noted is that of the trade itself. This may take the form of developing from the ranks of the workmen a superior class of foremen and of skilled workmen; or it may take the form of revealing and developing to untold usefulness the small minority, estimated by one distinguished principal as three per cent. of his pupils, who are naturally observant, and who, under the training of these technical instructors, are likely to become the great inventors and masters of industries.

The greatest evidence of the value of these schools is their growing popularity, as shown by the number of pupils in attendance, and the disposition of the business interests in control of English city governments to increase the expenditure for these institutions.

Attitude of Trade Unions.

When the schools were first established the attitude of the trade unions was not friendly, in many instances the unions opposing their establishment. As time progressed and the real benefits of the instruction came to be fully realized, the unions withdrew their opposition, and at the present time they are very favorably impressed with the schools, and assist the students by offering prizes and scholarships and in some cases paying the tuition fees.

FRANCE.

Formerly in France the practice of the handicraft trades was regulated by the trade guilds. This system remained in vogue for several centuries, but because of abuses it was greatly restricted by royal order in 1776, and in 1791 the guilds were definitely abolished.

The first attempt to establish an industrial school in France was made by Duke de la Rochfoucauld. In 1799 it was declared a national school, and later was converted into a school for training foremen. It was followed by other government institutions of a similar character, but it was not until the last third of the nineteenth century that means were really provided for the technical training of ordinary workmen.

There is at present an elaborate system of trade and technical schools founded and controlled by the government, and others operated by private individuals and municipal authorities. The government has provided liberally for the maintenance of these schools, and to-day France possesses a remarkably complete system of trade and technical schools, operating under public auspices, for furnishing technical education in all grades, from the teaching of the simple operations of ordinary trades to the training of engineers for the most advanced scientific and technical work.

The year 1878 may be considered as the starting-point of the modern movement to establish a system of public trade and technical schools of a primary grade in France; and in December, 1880, a law was enacted providing for grafting technical instruction upon existing primary schools, and they were maintained by the departments and communes. One result of this law was the establishment by the government of three national trade schools, which were intended to serve as models for others, and at a later date another school of the same character was opened. In 1892 a change in the organization and control of primary technical schools was made, and for the first time France had a system of primary trade and technical schools under government control, and to the ministry of commerce and industry was intrusted the provision for industrial education. The ministries of public instruction and fine arts, and public works also, have jurisdiction over some of the schools. The ministry of commerce has supervision of all the State technical and trade schools proper, except those teaching mining and decorative or industrial art.

Aside from the State schools, a large number of institutions, including municipal, communal, departmental and private schools for purely trade and technical instruction, are subsidized by the government and placed under the supervision of this department. In addition, there are a number of trade schools, continuation schools, trade courses, etc., which are maintained by local governments, trade unions, employers' associations, religious orders, societies, etc. For a number of years the municipal authorities of

Paris have been very energetic in providing model institutions for trade and technical education, sparing no expense in the matter of buildings, equipment and teaching personnel; and, as a result, Paris has the most progressive schools in France for the primary grade of trade instruction.

The number of institutions established by labor unions and employers' associations is very large and rapidly increasing, the greater number being evening trade, technical and drawing schools. Most of them are what is known as continuation schools and courses, although there are a few genuine trade schools among them. They are found all over France, but are naturally more numerous in Paris. Many are subsidized by the State, department and municipality. There are also a number of important industrial schools founded by the various religious orders, particularly the Brothers of the Christian Schools and Salesian priests. An elaborate system of administration and inspection of the State and subsidized schools has been provided by law.

Classification.

Schools for advanced industrial education. Schools for decorative and industrial art. Practical schools of commerce and industry. National trade schools. Trade schools for several trades. Trade schools for single trades. General industrial schools. Trade and technical continuation schools and courses. Industrial drawing schools.

Among the subjects taught are: blacksmithing, molding, carpentry, wood turning, wagon making, mechanical and electrical engineering, spinning, weaving, dyeing, drawing, architecture, engraving, gun making, embroidery, millinery, artificial flower making, dressmaking (for women), marine engineering, printing, typesetting, tailoring, book binding, lithography, stenography and typewriting (for girls), physics, chemistry, shoemaking, textile engineering, watch making, machinery, locksmithing, plumbing, etc. The courses run from two to four years, with day, evening and Sunday sessions.

Tuition.

Tuition fees, in some cases including board and lodging, run from 2,800 francs ($540) a year for the high commercial school to as low as 5 francs (97 cents) in other schools for each course taken. In some institutions no charge is made for tuition; in others tuition is also free, but students are required to buy certain meals at the school (except those in indigent circumstances), for which a charge of 4 to 11 cents is made. In many institutions a small deposit is required to defray cost of materials and supplies used, and as a guaranty against damage to school property. In many cases scholarships are given, and tuition fees for those not able to pay are remitted. In some instances a small entrance fee is charged.

Qualifications of Students.

Students must not be less than thirteen years of age, and, as a general rule, not over sixteen years of age, although in some cases nineteen years is the limit. While all applicants are generally required to have a primary education, yet some institutions make it obligatory upon the candidate to pass a competitive examination for admission.

Benefits.

While trade and technical education is not intended to do away with apprenticeships, but to furnish a supplementary aid in the application of theory to practice, yet graduates of these institutions find no difficulty in readily obtaining employment, and at a higher remuneration than those who have not a technical training; and in some cases the school training has been found to supersede, or at least materially reduce the time of, apprenticeship. Employers prefer school-trained men, and give them the preference whenever possible.

BELGIUM.

Belgium has recently established a fine system of technical training schools, over which the government has supervision. Each year the ministry of industry and labor receives from Parliament, as a subsidy, a sum to be distributed among the schools entitled to it. The ministry has adopted the following general rules regarding assistance rendered: for schools of theoretical instruction only, as industrial schools, a subsidy equal to one-third the total expenses of the school is given, after deduction has been made of any rent paid and the sum realized from tuition fees; for trade schools proper, combining both theory and practice, the subsidy is equal to two-fifths of the total expenses, after similar deductions have been made. The government also pays half the expense of equipment of the schools with the necessary appliances. Almost all the important schools are also subsidized by the provinces or communes in which they are situated, and certain sums are also received from individuals and industrial organizations. The government, however, has taken no part in the formation of the schools, only exercising a supervision over them after they are established. A system of regular inspection by a corps of expert inspectors, attached to the ministry of industry and labor, is maintained by the government over the subsidized schools. Schools may be established by communes, by private individuals, or in some cases by the provinces; and all have the privilege of receiving subsidies, if they meet the requirements imposed by the ministry of industry and labor.

Classification.

Institutions for Females. — Trade schools, including: (*a*) trade schools proper; (*b*) trade and housekeeping schools; (*c*) housekeeping and trade schools. Housekeeping schools and housekeeping classes. Trade courses. Apprenticeship shops.

Institutions for Males. — Industrial schools. Trade schools. Superior trade and technical schools. Saint Luke trade schools. Apprenticeship shops: (*a*) for stonecutting; (*b*) for weaving. Trade courses.

While these institutions differ essentially in character, there is not one that does not keep strictly in view the idea of preparing students to be able to earn their living by working in the particular branches of industry taught.

Great importance is attached to drawing in all trade and industrial schools, and even in the trade schools for females drawing forms one of the principal branches of instruction. This drawing is given for a practical end, and is given with reference to its use in particular trades or industries.

As a means of developing the highest efforts of the students, nearly every trade or industrial school has a small museum in which is placed its best works; and a public exposition of the work at the end of the year is a feature in most schools, especially in the trade schools.

Character of Instruction.

Trade Schools for Females. — The trade schools proper are those having the most complete program, both in theoretical and practical work, the sole object being to teach the trades open to girls, at the same time carrying forward the ordinary school education begun in the primary schools. These schools have a general course which is obligatory for all pupils. This generally includes such branches as French and Flemish, arithmetic, history, geography, hygiene, domestic economy, etc. The trades taught are necessarily limited in number. They include dress making and cutting, millinery, artificial flower making, industrial drawing and ornamentation, painting (on glass, china, textiles, etc.), linen work (lingerie), embroidery, etc. Usually the general recitations are heard in the forenoon, and the practical part of the trade teaching is done in the afternoon. In these schools housekeeping is not taught except incidentally, and there is no effort to prepare the student for earning her living by housework.

The trade and housekeeping schools have a less extended course, both in theoretical and practical work, than do the trade schools proper, but considerably more time is given to instruction in housekeeping. This work includes mending, washing, ironing, cooking, etc. Instruction is given in the morning and afternoon, as in the trade schools proper.

Housekeeping Schools and Housekeeping Classes. — These schools are intended for girls of the laboring classes, and, while primarily designed to fit girls for the proper care of their own homes, the effect of the instruction received is to prepare them for entering domestic service. They probably constitute the most interesting class of scholastic institutions in Belgium, and, while they are interesting as educational institutions, they are much more so as social institutions.

The schools are open from four to six days a week, two sessions, each of two and one-half to three hours, being held each day. In the housekeeping classes there must be at least two sessions a week, each of two and one-half to three hours. In those schools open every day the complete instruction may be given in one year; in those open but four days a week, two years; and in the housekeeping classes, two years.

Industrial Schools. — By the term industrial school, as used in Belgium, is meant a continuation school, in which is taught a number of scientific or technical subjects relating to industrial work. There are no manual exercises, such as are practised in trade schools, the instruction being of a purely theoretical nature. These schools constitute the largest and most important class of institutions that exists in Belgium for the technical training of young men, and their object is to give the workman scientific instruction which he cannot acquire in the shops, and to enlarge his understanding by imparting to him a knowledge of the general laws which govern the transformation of matter, in order that he may gradually relinquish routine work, and provide himself with the means of increasing the economic value of his labor.

These schools are especially adapted to the needs of those already engaged in trades or industrial work, the instruction being given outside of working hours. They do not intend to teach the practical part of particular work or trades to young men as do the trade schools; and, although their programs are so arranged that boys may prepare themselves to enter particular trades, with a good knowledge of the theory involved, these schools appeal more particularly to those already employed.

Trade Schools for Males. — In these schools, as their name implies, the object is to teach the practical work of the trades, as well as the necessary amount of theory. Hence the instruction includes manual exercises; in other words, apprenticeship in trades. In this respect they differ greatly from the industrial schools, in which, it is seen, the scheme of instruction does not include manual exercises.

These schools owed their origin to the pressing need of skilled, all-round workmen in many of the trades. The tendency in the private establishments was too much towards specialization to allow workmen the opportunity of learning more than certain branches of particular trades; and, moreover, it involved a loss of wages when a workman was transferred, voluntarily or involuntarily, from one branch where he had gained efficiency to another in which he was deficient, or of which he was totally ignorant.

These schools do not undertake to teach such a diversity of subjects as do the industrial schools. Trade schools are sometimes founded for the purpose of teaching the theory and art of a single trade, as, for instance, the tailoring schools; others have a more extended program, and teach several trades. In some schools there is no general course of study aside from the theories pertaining to trades and the drawing applicable to them; while in others there is a well-defined general course, including such subjects as arithmetic, algebra, geometry, French, Flemish, geography and mechanics.

With regard to the hours of study there are two distinct classes of trade schools. In one class the school apprenticeship is intended to supplant entirely that of the shops. In such schools the apprentices work all day, with intermissions for lessons in theory. In the other class of schools the instruction is given at night, either every day or on certain days of the week, one school having a Sunday session and two night sessions during the week. The duration of studies varies in the different trade schools, ranging from two to five years.

Tuition.

Each school follows its own desires regarding payments required of students. In some instruction is gratuitous, in others a small entrance fee is required, while in still others a regular tuition fee is charged. With few exceptions, however, the payments required of students are very small, and are within the means of the laboring classes, from whom the students mainly come. In some of the schools for girls tuition ranges from 8 francs ($1.54) per quarter to 100 francs ($19.30) per year. In some institutions tuition is free to residents, non-residents, however, being required to pay. In other schools for males the fees run from 10 francs ($1.93) to 250 francs ($48.25) a year for regular students; while specials pay double rates, and foreigners in some instances pay as high as 1,000 francs ($193).

Qualifications of Students.

Students must be at least twelve years of age, and possess an elementary education, some schools insisting upon an entrance examination. If over twenty years of age, the candidate must prove that the military laws have been complied with.

Benefits.

The consensus of opinion among employers is that graduates of trade schools are preferred, as being better qualified to do the work required. From the statements of employers themselves it is seen that trade-school instruction has proved very beneficial, enabling the graduates to more readily obtain employment at better wages, and materially enhancing their prospects for advancement. It also shortens the time necessary to be spent in apprenticeships.

Attitude of Labor Unions.

Labor unions seem to be in favor of trade-school instruction, and encourage a desire for wider knowledge and better conditions on the part of apprentices.

GERMANY.

Trade education has made great progress in Germany during the last few decades, and its development has corresponded with a most remarkable advance of scientific knowledge and industry. There are special schools for the training of employers and managers, foremen and bosses, and for the trade education of artisans.

Trade and technical schools are often founded by communes, guilds and industrial associations. Where the means of the locality are insufficient, or a national need exists, State schools have been established. The State ordinarily furnishes the school supplies upon the establishment of a trade school, the amount of the State contribution depending mostly upon the capability of the community. It is higher where attendance is compulsory than where it is not. There are important differences between the German States, both as regards the extent to which provision has been made for trade and technical education, and the lines that such action has followed.

Prussia usually requires that the bodies or individuals interested in the trade schools shall provide and maintain the quarters and furnishings, and continuation schools must furnish light and heat. In Bavaria the continuation schools and communal institutions are subsidized by the districts and State. The trade schools are partly State and partly district schools with State subsidies. In Saxony no regular scheme is followed, but whenever the assistance of communities or interested parties is not sufficient, the State usually grants subsidies.

In Wurttemburg a tuition fee is charged in the industrial continuation schools, the community furnishing the quarters, but whenever new buildings are constructed, the State contributes; half the remaining expense of maintenance is paid by the community and half by the State. In Baden a division of expenses is made among the State, the community, and the institutions. In trade and technical and continuation schools the community provides quarters, heat, light and school supplies, and pays part of the salaries of the teachers. The remainder of the teachers' salaries and travelling expenses is paid by the State. Teachers not on the regular lists are paid by the community.

The most marked tendency in recent years regarding the control of trade and technical schools in Germany has been towards centralizing authority in the State governments, the result being that the State is now thoroughly committed to the policy of supporting industrial schools, and has provided for the necessary supervision.

Classification.

Technical colleges. Secondary or intermediate technical schools. Schools and museums of industrial art. Schools for foremen. Schools for the building trades. Schools for the textile trades. Trade and industrial continuation schools. Industrial drawing courses. Other institutions for industrial education.

Character of Instruction.

Instruction is given in the highest branches of scientific knowledge, as well as in the lower grades of trade and technical training, and comprises engineering, architecture, machine construction, chemistry, building trades, textile working, drawing, cabinet making, wood carving, modeling, engraving, stone carving, ivory carving, lithographing, glass and china painting, sculpture, shipbuilding, electrical engineering, civil engineering, physics, business law, basket making, straw plaiting, carpentry, horseshoeing, pottery, toy making, watch and clock making, typesetting, etc. The continuation schools for girls instruct in book-keeping, stenography, typewriting, machine sewing, embroidery, millinery, cooking, etc.

Tuition.

Tuition fees run from 1 mark (24 cents) a month for each subject in the girls' evening school to as high as 100 marks ($23.80) per term in the building trades. In some instances fees are partly or entirely remitted. In the textile schools higher fees are charged, ranging from 200 marks ($47.60) to 800 marks ($190) a year, according to whether the student is a Prussian, a native of another German State or a foreigner, the latter always paying considerably more than the native student.

Qualifications of Teachers.

In the selection of trade instructors preference is given to skilled and practical men. Teachers in trade and continuation schools are expected to keep in close touch with the industries in their vicinity. Practising architects, superintendents of workshops and mechanical engineers, especially those who have had experience abroad, are mostly sought after as instructors in trade drawing and in industrial art. Special examinations for teachers exist in only a few of the German States.

Qualifications of Students.

Students are required to be not less than fourteen years of age; and while, as a general rule, no entrance examination is required, yet applicants must furnish satisfactory evidence of their ability to perform the work demanded.

Development of the Apprenticeship System.

Great efforts have been made in Germany to protect and extend the apprenticeship system, and that matter is now in control of the guilds in different localities, the latter being created by law, and really acting as agents of the State in the regulation and employment of apprentices.

AUSTRIA.

Industrial education in Austria was originally established by the State calling in from foreign lands experts in particular branches of industry to give instruction to workmen in their trades; and in 1751 the first effort to establish a regular school for practical instruction was made. This idea was never carried out, however, but in 1758 a real beginning was made by the founding at Vienna of a manufacturers' drawing school, followed in 1770 by the establishment, also at Vienna, of a commercial academy or high school.

From 1771 to 1774 the government applied itself to the creation of schools that would afford the same opportunities for instruction to manufacturers and handicraftsmen that the academy did to merchants; and a comprehensive system of normal, central and industrial schools was founded, in which industrial training received considerable recognition. This was followed by the creation of other schools, and in 1815 the Polytechnic Institute of Vienna was opened, the first of its kind in Austria, and the first but one in Europe.

In 1851 an imperial resolution was passed, providing for practical instruction and training in particular branches of industry. Technical education was also being developed in other directions. Special schools for particular trades were created by communal authorities, private corporations and manufacturers. No very rapid progress, however, was made in the development of the scheme outlined in 1851, and in 1868 a reorganization of the plan was effected. Meantime, trade schools were gradually becoming more numerous in the empire, and in 1867 there were schools of weaving, passementerie, lace making, straw plaiting, drawing and modeling, wood carving, watch making, etc., in operation. In 1863 the Museum of Art and Industry was founded at Vienna.

In 1872 the Imperial Council placed to the credit of the ministry of education and the ministry of commerce a yearly sum of 80,000 florins each, to be applied to the development of industrial education, and a division of industrial schools was made between the two ministries. This division resulted in not a little rivalry between the two ministries, and a stimulation was effected which otherwise would not have occurred. The ministry of commerce strove to develop the special trade schools, with the idea that they should give as practical instruction as possible in matters corresponding to the localities in which they were located. The expense of creating and supporting the schools fell primarily upon the local authorities, the ministry of commerce assisting through the grant of yearly subsidies. During this period the ministry of education was engaged in creating intermediate industrial schools, and devoting attention to the training of teachers, securing proper school furnishings and materials for instruction.

In October, 1875, an imperial decree was issued, providing for the founding of State industrial schools; and in the following year they were created, and proved very successful. In 1881 the schools were united into one system, such as prevails to-day, and the ministry of education was given the appropriations and management, with the co-operation of the ministry of commerce.

Classification.

Central industrial educational institute. Schools for important groups of trades. General handicraft schools. Schools for particular trades. Industrial continuation schools. General drawing schools.

Instruction in these schools embraces such subjects as plaster casts, textile fabrics, laces, embroidery, glass ware, jewelry, enamel, metal work, wood working, chemistry, electro-technics, photography, printing, leather working, drawing, building trades, machinery, etc.

Character of Instruction.

The trade schools educate the pupils for specific trades; but the handicraft schools — more in the nature of manual training schools — give a thorough preparatory training for industrial work in general, such as will tend to supply the handicraft trades with a select class of workmen. In general, they include, in a two or three years' course, a continuation of the regular public school education, combined with instruction in a number of branches of practical value in industrial occupations, instruction in drawing being especially emphasized. The handicraft schools are not intended to replace apprenticeships, but only to constitute a good preparatory training therefor. The schools for particular trades, being intended to promote important individual trades, are located in both the large and small communities, where certain individual trades have obtained some importance.

Qualifications of Teachers.

The teachers in the State schools are partly graduates of the technical high schools, partly persons trained in industrial arts and partly persons qualified as teachers of intermediate schools. They are required to keep in close touch with their schools and the manufacturers of the vicinity. In addition to the actual teachers, all trade schools have for the practical training in workshops master workmen, especially trained as superintendents or foremen in large manufacturing establishments.

Qualifications of Pupils.

While some schools do not admit pupils under fourteen, others admit them at twelve years of age. In most schools, pupils, in order to be admitted, must have completed their regular common-school education, have passed the age of fourteen years, be in good physical condition, and wherever required pass an entrance examination. Special students are also admitted, but they must have passed the age of eighteen years. In going from one year's grade to another, pupils must pass a satisfactory examination. Candidates for the high grade of trade instruction, fitting for foremen, managers, etc., must be graduates of the lower grade intermediate schools. In the course for master workmen, applicants must not be under twenty-four nor over forty-five years of age.

Fees.

Fees vary in different institutions, matriculation in some being 2 crowns (41 cents), in others 4 crowns (81 cents); while tuition ranges from 100 crowns ($20.30) to 240 crowns ($48.72) a year, in addition to which deposits for the use of materials and apparatus and to cover any damage to same must be made, running from 10 crowns ($2.03) to 60 crowns ($12.18) a year. In some instances a fee of 20 crowns ($4.06) per month is charged for laboratory work. Books and requisites for theoretical work are furnished by the pupils. In the case of worthy pupils, unable to pay, the fees are many times remitted. Scholarships are also offered to assist pupils. Other schools charge a matriculation fee of 1 gulden (41 cents), with tuition fees from 1 gulden to 3 guldens ($1.22) per half-year term, free scholarships being granted to persons of small means. In other institutions a charge is made of from 1 florin (41 cents) per course to 15 florins ($6.09) per half-year course for regular students, special students ordinarily paying about double these rates. Several schools offer free tuition, except in the case of foreign students, who must pay from 25 florins ($10.15) to 100 florins ($40.60) per term.

Benefits.

The opinion seems to prevail that trade schools have improved the educational and industrial condition of the working classes. While some employers prefer the practical shop-trained man, as being more dexterous, others realize that ultimately the school-trained boys will become the more valuable workmen, and therefore prefer to employ them, encouraging in every way the attendance of evening continuation schools by their employees. Statements from foremen and other skilled workmen show that graduates of trade schools readily obtain employment, with enhanced conditions relative to higher positions and better wages. Trade unions have played practically no part either in creating or opposing the establishment of these schools.

Hungary.

In Hungary the first beginnings of industrial instruction is found in the convents, especially in those of the Benedictines, who maintained regular workshops which formed the nucleus of trade schools. This sort of instruction spread to the cities, and in the fourteenth and fifteenth centuries several schools were maintained in which industrial branches were taught, and during the eighteenth century industrial instruction received a great impetus. In 1783 the government ordered cities to establish Sunday drawing schools, and made it obligatory for apprentices in workshops to attend them regularly. In 1872 a law was passed making it a duty of apprentices regularly to attend so-called apprentice schools; and the law of 1884 compelled any community where there were fifty apprentices working in shops or factories to establish and maintain such schools. The government also founded schools in which foremen and masters should be educated, and schools of weaving, wood and metal working and ceramic industry were established. This special education is supported by the State, cities, counties and towns.

Classification.

Apprentice schools. Schools for trade journeymen. School workshops. Industrial technical schools. State industrial schools. Industrial schools for women. Industrial drawing schools. Lower industrial schools. Manual training schools. Industrial museums.

Character of Instruction.

Day, evening and Sunday courses are maintained, and among the subjects taught are: the mother tongue, geography, penmanship, arithmetic, book-keeping, drawing, weaving, braiding, stone working, toy making, lace making, modelling, physics, chemistry, machine construction, textile technology, leather working, architecture, surveying, bridge and hydraulic engineering, watch making. Three-year courses generally predominate.

Tuition.

In some institutions tuition fees are charged, and in others no charge for tuition is made, the schools being entirely supported by the States or communities.

Qualifications of Teachers.

The teachers of apprenticeship schools are usually teachers of common, elementary and high schools, who teach in these evening and holiday schools for a small additional salary. The technical schools proper have regular faculties, the members being regarded as State officers. The professors in schools for wood workers, weavers, metal workers and machine builders are graduates of the department of mechanical engineering in the polytechnicum; those in schools for stone workers and masons are sculptors and architects; those in schools for the ceramic arts are chemists, sculptors and modelers. Each one of these teachers is sent abroad for a year or more at the expense of the State, before he is appointed definitely, to study his branch in the noted schools of other countries, or he is sent to a university to enter as a special student.

Qualifications of Students.

Boys must be at least twelve years of age, and in order to be eligible to some institutions must have completed the course of the elementary schools. Certificates for proficiency are issued upon graduation. Graduates of technical schools are preferred by employers.

SWITZERLAND.

The first efforts looking towards the development of industrial schools in Switzerland were made about the first of the eighteenth century. In the early twenties the first trade school proper was opened. By article 22 of the new federal constitution, adopted in 1848, authority was conferred on the federal government to create a Swiss university and polytechnic institute; and in accordance therewith a polytechnic school was opened at Zürich in 1855. The year 1884 witnessed a progressive movement for the establishment of trade and technical education in Switzerland, and in June of that year, by resolution of the Federal Assembly, the development of trade and technical education was made a national affair. This provided for assistance under certain conditions to all institutions for trade and technical education that desired it. This has resulted in establishing new institutions and developing those in existence, and has given a great impetus to trade and technical education throughout the country. Since its adoption the number of trade schools has doubled, and other classes of schools, like drawing schools, workingmen's evening schools, etc., have greatly increased. As before stated, the government subsidizes these schools, and in 1895 State subsidies were granted to schools for the teaching of domestic economy and trades to women.

Classification.

Technical colleges. Secondary technical schools. Industrial art schools. Trade schools and apprentice shops. Housekeeping and domestic service schools. Industrial continuation and handicraft schools and trade courses. Industrial drawing schools. Industrial museums.

Character of Instruction.

A few of the subjects taught are the following: watch making, machinery, electricity, architecture, building trades, chemistry, drawing, hydraulics, modelling, ceramics, stone and wood carving, artistic wrought-iron work, locksmithing, tinsmithing, furniture designing, printing, book-keeping, French, German, algebra, trigonometry, physics, ladies' tailoring, lingerie making, dressmaking (for women), instrument making, pattern making and casting, silk weaving, etc. The course of study comprises from two to five years in different branches.

Qualifications of Students.

The minimum age at which students are admitted to any school is thirteen years, running from that to eighteen years. In some institutions no examination for admission is required, but the applicants must possess satisfactory evidence of a primary education, and show that they have sufficient knowledge to enable them to carry on the work. In other institutions a preliminary entrance examination must be passed.

Qualifications of Teachers.

In order to obtain competent instructors for the various trade and technical courses, and especially for the courses in trade drawing, the department of industry and agriculture in 1885 secured the creation of special courses for teachers in the Technikum at Winterthur. At the end of each year special examinations are held, and the successful competitors are given diplomas. Two-thirds of the expense of these courses is borne by the government. The training of teachers is also indirectly encouraged in other ways.

Tuition.

Tuition fees while low vary somewhat, running from 10 francs ($1.93) a month for residents of Switzerland to 50 francs ($9.65) a term, foreign students paying 25 francs ($4.83) a month. In some institutions the students are insured against accident, the school paying half the premium. Tuition is free to Swiss citizens in some schools, foreigners paying 50 francs a year. In other schools special courses for foreigners run to 450 francs ($86.85) a year. A small matriculation is charged in some cases. Scholarships are awarded, and in many cases tuition is wholly or partly remitted for worthy students unable to pay.

ITALY.

As early as the fifteenth and sixteenth centuries several efforts were made to establish industrial education in Italy, but it was only after the formation of the national union that it was really established there, when industrial schools and schools of arts and trades, in addition to the schools for literary, scientific and general culture, were established by the local authorities. Sometimes they were founded and maintained by workingmen's associations. They usually received subsidies from the State, the provincial and communal authorities, the chambers of commerce, and sometimes even from the savings banks. They conform to the necessities of the local situation, and are under the jurisdiction of the ministry of agriculture, industry and commerce, and the ministry of public education.

Classification.

Industrial schools and schools of arts and trades. Schools of art applied to industry, and schools of industrial drawing.

Character of Instruction.

Among the subjects taught are: resistance of materials, mechanical technology, power machines, electrotechnics, textile technology, physics, chemistry, architectural designing, wood carving, kinematics, statics, weaving, dyeing, mineralogy, topography, metallurgy, drawing, typography, tanning, modelling, wood and metal engraving, decorative painting, plastic art, glass working, embroidery, etc.

Day, evening and Sunday sessions are maintained, and the courses run from one to eight years, three years being the general rule.

Qualifications of Students.

In some institutions pupils are admitted at the early age of eight years, while in others they must be at least fifteen years of age, and possess an elementary education.

Tuition.

Where tuition fees are charged they run from 5 lire (97 cents) for the first year and 10 lire ($1.93) for the second year to 700 lire ($135) a year for the higher educational institutions. Scholarships are also established, and tuition made free in some cases for pupils obtaining a certain rating in examinations.

Benefits.

Graduates experience no difficulty in obtaining employment at good wages.

Appendix No. 2.

ADDRESS BEFORE THE COMMISSION ON INDUSTRIAL AND TECHNICAL EDUCATION.

By Sir Wm. Mather, M.P., Manchester, Eng.

In relation to this act of 1889, it was passed in consequence of an inquiry which the Royal Commission made in the civilized countries of the world. The Commission appointed in 1883 made inquiries extending over a year in the various countries of Europe, and it fell to my lot to take America, Canada and Russia.

Of course it was a labor of love on the part of the Commissioners. We counted it a great honor to be selected for the purpose, and perhaps it would be of interest to you to know that the members of that Commission were chiefly manufacturers and commercial men, only one or two representing what you may call the scholastic side of the question. The industrial side of the question was of most importance, therefore the Commission was largely composed of large industrial employers.

It was in consequence of the reports made by the Commission that legislation was undertaken in England on technical and industrial education; and I may say that the evidence brought from America had perhaps as much effect as the evidence from any other country in directing legislation on the right lines.

It is curious that you should be asking me now here in Boston what we are doing, when we got our chief inspiration from America. It was your manual training schools that impressed me so deeply. I saw great possibilities in the American system of conducting technical and manual education, and our subsequent Act of Parliament took its form from the American evidence quite as much as from that of any other country.

The Act of Parliament of 1889 for technical instruction, passed five years after the Commission's report, provided that every municipality and local government authority, extending to those localities throughout the country not of sufficient population to possess a municipal council, should have power to levy a rate not exceeding 1*d.* per pound on the assessable value of the respective districts over the whole of England and Wales. Scotland and Ireland had separate acts of Parliament.

The municipal authorities of England and Wales had never been noted up to that time for any particular zeal in education. The school boards in the various localities conducted what we call the elementary stages of education; primary education, and the upper primary, which you would call the grammar school stage. At that stage public school education with us stopped altogether.

Under the elementary education act of 1872 there was no provision whatever made in the country for higher education, no high schools had been established under that act, and there was no provision whatever for the national education beyond the age of fourteen years. Up to that age it was compulsory.

When Parliament conferred upon the municipal bodies throughout the country the sole power for directing technical and industrial and manual training by the act of 1889, it was a new departure in the work of municipal councils; but, inasmuch as this kind of education had a distinct bearing upon the industrial life, the municipal councils took it up with considerable zeal. They did not regard it as general education, they regarded it as special education; and they saw that their local industrial interests would be served by establishing such technical and manual training schools.

I may say that the act did not make it compulsory that they should levy 1*d.* rates, and establish these schools, it was permissible, — they might if they chose.

That rate of 1*d.* in the pound would provide, say, in the city of Manchester, with 350,000 inhabitants, an income of somewhere from £14,000 to £16,000 per annum, and so pro rata, according to the population and the rating value of a town or city, the annual income on behalf of technical and industrial and manual training would be more or less.

In addition to this power of levying a 1*d.* rate, conferred upon the municipal authorities in 1889, in the following year of 1890 there was a sum of money amounting to something like one million sterling per annum available for technical and industrial education, derived from a duty on whiskey and beer, which had been levied by the Chancellor of the Exchequer to provide a compensation fund in connection with the proposal of the government to close some and restrict the number of public houses, or drinking saloons, as you would say, all over the country.

The bill, which would have carried into effect the wishes of the government in that respect in the year of 1890, failed to pass the House of Commons, so that the provision made by the Chancellor of the Exchequer in advance, by the million sterling per annum derived from the tax on whiskey and beer, could not be allocated. The bill having failed, there was no channel for the distribution of that money; whereupon we educationalists, especially the members of the Technical Commission in the House of Commons, pounced down upon the Chancellor of the Exchequer, and proposed that this million sterling should at once be absorbed by the municipalities throughout the country in the form of an annual grant from the government to assist the 1*d.* rate which they might levy for promoting technical and industrial training. While the government acceded to our request in part, we failed to persuade them to make it absolutely compulsory on the part of the localities to spend that money on education; but they did dispose of it in what they called the relief of local taxation, and they bestowed upon every governing body through the country, county municipal councils, town municipal councils, according to the population of each town and district, a portion of the £1,000,000, as a grant per annum, leaving them to dispose of it as they liked.

We obtained, however, a satisfactory expression of opinion from the House of Commons in connection with that incident; namely, that the House of Commons considered it most desirable that these municipalities should bestow this money solely and alone on technical and industrial instruction.

As an example of the zeal with which the municipal councils took up their work under the act of 1889, I may say that within two or three years every local body, excepting London and the town of Preston in Lancashire, actually bestowed that money, or most of it, derived from the tax on whiskey and beer, upon technical instruction or in the preparation for it, instead of applying it to the relief of local rates generally.

These were the sources, therefore, placed at the disposal of all our local bodies: the 1*d.* rate levied on the town itself, and this annual grant from the government of one million pounds sterling, divided among the towns pro rata to population.

The grant for the city of Manchester amounted to about £12,000 per annum. I may say here incidentally that since that arrangement was made we have by further legislation in 1903 made it an absolute annual grant from the national exchequer to all these local bodies forever for technical and industrial training. It is no longer optional; they are bound to give it to technical and industrial training.

The city of Manchester was not the first, but, as the city council has done the largest work in that direction, we may as well confine ourselves to that illustration, as showing the general activity of municipal authorities in promoting technical and industrial education. They proceeded to capitalize their annual grant of £12,000 per year. They borrowed money on the strength of that annual grant, and raised a sum of money something like £250,000 in cash. They also had further assistance.

For instance, we had already a technical school in Manchester, or a manual training school started entirely from the influence brought upon Manchester by America. My friend Dr. Woodward of the Washington University of St. Louis, who was a great pioneer in manual training, came to Manchester by request, in 1886, and gave a public explanation of his views. Owing largely to his efforts, we formed and established a training school by voluntary contributions, which did very good work for some years in the direction of technical and industrial education. We handed over to the municipal authorities all that establishment when they resolved to carry out their plans.

They proceeded to build large technical schools, having many branches of technical training for special trades based on scientific processes. The total expenditure I suppose was £350,000 or £400,000. The institution is very admirably equipped, perhaps equipped to the degree of luxury; but the municipal authorities were ambitious to have a perfect thing, and they got it.

This establishment is maintained partly from the fees of the students and partly from this tax of 1*d.* a pound on the inhabitants of the city of Manchester.

By recent legislation the authorities have the right to levy a tax of 2*d.* a pound of assessable value in the city, and may go to 3*d.* by permission of the Local Government Board, which is the government department in England controlling all the municipalities of Great Britain. With the consent of that board the municipal authorities can levy a 3*d.* rate, but in doing so they must include higher education above the grammar school stage in the public school system. They must establish high schools, and schools for preparation in the direction of technical instruction, so that boys and girls may enter these technical and industrial schools with some knowledge of elementary science, and with such general education as will enable them to understand the instruction given.

With these sources of revenue which I have described, together with the school fees, the municipal authorities consider, notwithstanding that they have spent all their "whiskey and beer" money in the building itself, — they consider the income would be sufficient, without making the fees high, to maintain that institution. It is now in full working order, and has been for about three years, and the work it does I will describe as follows. First of all I will describe the departments. There are departments of trade teaching in cotton industry, — the cotton trade is the chief trade of the district, — departments in engineering, machine construction, letter-press printing, building and all its branches, plumbing and all its branches, bleaching, dyeing, calico printing in all its branches, paper making, and to some extent there is a department of mining, but that is not so prominent as the other departments I have mentioned. There are laboratories for teaching in natural science, and a very competent staff of masters throughout.

It was hoped, when that great institution was established, that the working classes especially would be inclined to send their children, after passing through the elementary schools, to this institution, to take a two years' course at least in the training which it affords; but unfortunately, owing to the lack of interest in education and lack of appreciation for education in England, that hope has not been realized. This great institution, which could easily accommodate two thousand day students, has probably at the present moment two hundred, and these are rather of a casual sort. They come in for a year or a couple of years, and there are very few even of the two hundred taking a systematic day course of three or four years in trade training, or technical training, or manual training, let alone the courses in higher technology.

In consequence of this indifference to systematic day courses of instruction, we are not making very great use at present of the vast expenditure and opportunities afforded; but as a night school this place has about five thousand students during the winter months, beginning in October and ending in May.

These night students consist of all ages, — boys and girls of fourteen, who have already gone to work at some kind of occupation, up to men of thirty and forty years of age, employed at some special skilled labor; and those who are not in skilled employment, even laboring men, go there to take advantage of the lectures, and also to see if they cannot get some little scientific knowledge of processes to help them in their various occupations.

In that respect, as a night school, serving those already employed, the institution is doing very good work. Not very systematic, as you may imagine, as there is no compulsion. The students attend two or three nights a week; probably only a few attend more than three nights a week.

There are special courses drawn up in each department to suit the students coming in of all kinds. As a rule, those who attend do not take more than one or two departments, though there are some notable examples of young men who are trying to make up for lost time in early life. But this training is doing an important work, and those who have lost the opportunity before they began to earn a living are continuing their education on special lines helpful to themselves and to the industries in which they are employed.

That is an establishment which I should think contains every sort of industrial training that you could possibly require in Massachusetts, presuming you intended to give an opportunity for instruction adapted to all sorts of trade to those who are intending to follow industrial employment.

Take the cotton trade of Fall River, or Lowell, or Lawrence, and all those places where the cotton trade exists; if you had an establishment suitably located, you would no doubt attract a lot of young people of both sexes to take a two or three years' course in each institution. You know there is a passion for education in America among all classes, and notably among your working classes. Every parent desires his boy or girl to be equipped in the best way he can for an occupation in life; therefore I should imagine that in a State like Massachusetts, if you had such institutions as we have in Manchester, and as we have already in many other towns devoted to one or more industries, they would be filled with day students.

In the town of Salford, which adjoins Manchester, the same evidence applies to the technical school there as that afforded by Manchester. The authorities cannot get the young people to attend in the day time to take a regular course of instruction preparatory to industrial work as a living. They must plunge into work as soon as the law allows, and then their education depends upon that night work which I have described in connection with the Manchester school. That is the common experience at the present time in England.

In the town of Bradford, Yorkshire, perhaps there is some exception to be made in that respect, and for this reason: the town of Bradford suffered in its trade of woolens, worsteds, etc., owing to the advances made in Crefeld, Germany, which is noted for its trade school, — that is, the school for initiating young people who are going to follow the industries of Crefeld into something of the principles underlying this particular manufacture. The technical and industrial schools of Crefeld offered great inducements to working men to send their children, and they have sent them regularly in the day time, and their schools are full. They serve also for the sons of employers, the manufacturers in these trades; the training is adapted to them, and very good and valuable to them as future leaders or great manufacturers. Large numbers attend, and before young men enter the employment of their fathers, or any one else, they take a systematic course of three or four years in this particular industry.

Bradford suffered so much in consequence of the development in Crefeld of the woolen and worsted industry that they very early established a voluntary technical school before the passing of the Technical Instruction Act of 1889; and when the Legislature allowed the grant from the government, the municipality seized upon that, and established a very valuable institution, devoted chiefly to the woolen and worsted industry, with dyeing and bleaching connected therewith; also a department of mechanics, as every industry depends upon machinery; and consequently in all such schools there is a department of mechanics.

In the Bradford school you would find in the day time a considerable number of students, the sons of employers attending especially to get some knowledge of the science of their trade before they enter on their career. But, with the exception of Bradford, no marked progress has been made in any town in England in the direction of inducing the working classes to send their young people to school for systematic day courses; and I am sorry to say no marked interest has been shown by the employers of labor to send their sons to such schools. We can only, therefore, look to the future for the gradual growth of public opinion in that direction to enable us to utilize such schools as those we have already established.

I apprehend that, if the States of America passed a State law, if you had municipal power to establish schools from the rates in the same way as you have established your public schools from the rates, you could go forward and establish these manual training schools, and I apprehend they would be full of day students right away.

You would probably differentiate then between the high school line of instruction and the technical school line of instruction. You would probably make a division at the grammar school stage, and you would have two branches of higher education. Your industrial and technical schools would begin with elementary science, probably following on the instruction of the grammar school, and you would have your class rooms and laboratories there, and your class instruction connected with the technical departments and workshops where processes are taught, and the science underlying them.

I suppose you would be able to count before you began on all these schools being utilized. That is my opinion of what I see in America, — of the spirit in America as compared with England. You would also be able to utilize, as we do, some of " the water that has passed the mill," in the sense that some of these people who have already gone early in life to a trade will find out how much they must know before they become masters of their crafts, and therefore would attend evening classes; and thus, I think, pursuing similar lines to those we have pursued during the last ten or fifteen years for evening students, you would afford even greater opportunities for your people already employed gaining a living than we do; you would afford them opportunities by day school training as well as by evening instruction for those gaining a living, to become a still more cultivated industrial population, worthy of the resources of your great country.

Mr. WRIGHT. We have three schools in this State now, one at Lowell, one at Fall River and one at New Bedford. These schools are supported in part by the cities in which they are located, and in part by an appropriation from the State treasury, made each year by the Legislature. That follows in a way the principles you outlined. If these trade schools, like the one in Manchester, were to be created throughout the State, or in different industrial centres, they would have to be by the authority of the State Legislature given to the municipalities to appropriate money for such purpose of general education under the general law. No such specific legislation is now immediate. Each municipality, whether a town or a city, makes its own appropriation to any extent it desires in its own wisdom, without specific authority.

Now, the great question which we will have to consider will be, how, if trade schools are necessary, are they to be established by specific laws? You have described how they are done in England, and that is just the information we wanted.

I would like to ask this question. You have anticipated it in your remarks about the attendance upon these schools by the children of the wage earners themselves, — that the day school does not attract them. Will it attract them? Is that attraction increasing?

I believe it will attract when the wage-earning classes of England become better educated. I ought to explain why to some extent our wage-earning class is a little indifferent to all these matters of education. You must remember that in 1872 for the first time in the history of England we had a national system of education. Up to that time ignorance generally prevailed throughout the length and breadth of the land, though a considerable number of working men were self-taught. I can remember when I was a young fellow serving my own engineering apprenticeship in my father's concern. I remember quite well that the newspaper could not be read by two-thirds of the engineers and mechanics we employed, among whom were clever men and dexterous men with their hands, and good mechanics for manual purposes; but they had an arrangement by which one of their fellow workmen read the papers to them during the dinner hour. It was quite a common thing to find working men in large numbers who could not read or write.

You know the late Bishop of Manchester, Bishop Frazer, before he became bishop, came over here and lived for two years, prior to 1872, to inquire fully into your national system of education; and upon your system our act of 1872 was based.

The first crop of children of those new schools established throughout the length and breadth of England and Wales did not come out until the year 1880. Taking eight years for school life, our first crop of children trained in the elementary schools came out at fourteen years old in 1880–84; add another ten years at least for these people to marry and become parents, and it was 1890 at the earliest before the children of those who attended the first time in our history a national elementary school were born; and another five years must be added before the children attended school; that would be in 1895 at the earliest. So you see we are only beginning to feel the effect of education in the parents of to-day.

Our hope is that in another ten or fifteen years the children who have been benefited in these recent years will have sense enough, when their children come into the world, to take advantage of these institutions which are now being organized.

Mr. Wright. So that our century and a half of experience in the public school system makes our field for this special work more fertile.

Your field is unlimited. There is not a State in America which would not supply the material which you want to deal with.

I want to make a proviso in relation to what we call industrial education. We do not call it trade education; we call it industrial education. We have set ourselves from the first against the idea of teaching any trade to the perfection necessary to enable a young fellow to go to any employer of labor, and say: "I am a cotton spinner," "I am a weaver," or "I am so and so," and ask for certain wages, etc. That we have set our faces against from the very first. We say it is not a sound policy, and we think it will not bring up a skilful industrial population. Our limit is to instruct by the actual work and the actual processes required in *all* manufacturing; to instruct the young boy or girl to the stage at which they will be enabled to understand why everything is done, and what is the best way of doing everything, to make such and such articles, by such and such processes. That is, you teach the science of production, and the methods of its application.

We give sufficient practice with real tools, and real processes, to enable us to say to employers of labor and trade unions through the country: "We are fitting the children of the working classes to become far more intelligent men, to be able to enter into your employments, and to lift up your employments by their knowledge to a higher stage, to understand more perfect work, to produce more beautiful things, by scientific methods instead of by rule of thumb; that is, to use the smallest amount of material, to get at the most perfect results, to combine taste with the perfection of workmanship, to appreciate the perfection of workmanship, and accuracy, the perfect fitting of things, the interchangeability of parts, etc."

The science and methods of trade are taught in these schools, and we tell the trade unions: "We are your helpers; we are seeking to perpetuate your trades for you in England; we are increasing efficiency. If the community does not spend money in this way, your trade will gradually go down, and you will open the doors of Great Britain, — not because we have free trade, — but you will open the doors of Great Britain to the rest of the world to send stuff to us because it is so much more perfect; because it is adapted to the wants of the age; because they change their methods from year to year, owing to their knowledge of the sciences employed in these industries. You keep at the old-fashioned processes until somebody comes and pushes you out of the trade, and then you look around to see why you did not succeed in competition with other nations; like the Bradford people when the Crefeld people pushed them out. How is it that our great reputation in former years for English goods passed away in some degree from us? How is it that the merchants of America, when they wanted goods not made there, ceased to buy in Bradford, and went to Crefeld?"

The truth dawned upon our manufacturers, and they found their people did not understand the object of the work upon which they were engaged. They simply waited to be told to do this and that, and they could not help themselves. They could not make any suggestions to their employers; they were dexterous with their hands, but beyond that there was nothing to be gained from the working people in the way of suggestions for the improvement of manufactures.

Now, all that is changing. We teach our trade unions that we are their best and strongest friends in establishing these schools. We tell them they must encourage in every way they can the perfection of production.

We also tell the trade union: "It will not be necessary for the sons of your members, the working men, to begin at fourteen years of age in the workshop. They are losing time by beginning so early. You must send them after the elementary schools into these other schools, that they may be initiated into the scientific foundations of the trade they intend to follow, and also from these schools select a trade which fits the peculiar natural ability of a boy."

For instance, a boy may go into such a school, and the father may say: "I want you to be a mechanic," or "I want you to be so and so;" but the lad may discover some peculiar quality in himself, indicating that he had better go to the textile trade or to the building trade. The boy's natural line of thought and ability is assisted in making the selection as to which trade he will follow, and he may take the department in the industrial school which prepares him for that trade in the best possible way.

Then we say: "Let them remain there until they are seventeen years of age, make any sacrifice; and at eighteen they will enter into a manufacturing establishment with such aptitude that employers will be very glad to take them."

An employer can earn money on the work of a young fellow having a knowledge of method and a knowledge of the science underlying his particular trade, accompanied by considerable manual dexterity. Employers will say: "These are young fellows I can make use of. I can give them not the conventional four shillings a week which is paid to a first-year apprentice, but ten shillings or more. This youth is doing good work for me, and I will give him the opportunity to improve, so that by the time he is twenty-one years of age he will be worth double the amount of wages he would have been able to earn had he gone to work at fourteen and worked all along the line in the workshop up to twenty-one years of age."

That is the argument to keep before the minds of trade unions. They cannot oppose it. They would probably say: "That sounds reasonable. It will help all along the line, and will not interfere with our special rules as trade unions; and if they do, we must adapt our rules to these great advantages in the interest of our trades."

We find our English trade unions are not antagonistic to this idea. They are not enthusiastic as yet, but they are becoming true friends to education of the practical sort. Some co-operative societies of working men will give a certain amount every year to the technical school of their town; because it is good as a night school, they will support it as a night school; and I do not find any real antagonism in England to industrial training in day schools, since we have reasoned this out on the basis I have described.

We say to the parents: "We are preparing your sons to enter the workshops, and to be worth more when they arrive at adult age than they would be if they commenced at fourteen years of age."

Mr. WRIGHT. What is the effect upon the young people's character, morals, etc., of this kind of training?

I can answer that with pleasure, because the testimony is altogether favorable. When you can take a boy from the elementary school and put him through such a training as I have described, up to seventeen or eighteen years of age, it strongly tends to make a man of him in every sense of the word. He learns to understand the application of law to life, both the moral law and the scientific law. He thinks more seriously, and conducts himself with greater self-respect. Life is so full of interest that his pastimes and pleasures do not partake of that objectionable character which they are liable to assume if the lad is thrown much with working men at fourteen years of age.

We hope in that respect our people are gradually improving; but the tendency used to be, with lads sent among men at fourteen years of age, and also girls in factories, to make them coarse, indifferent to their parents, and independent, seeking for all sorts of pleasures and pastimes which are not elevating in effect. Of course there are large exceptions, as you know, but the tendency under the old method of going to work so early was downward instead of upward.

This systematic training and knowledge of the laws of nature, some idea of how nature works, what nature furnishes for the use of man, and the scientific principles upon which man by first obey-ing the laws of nature finally makes nature obey him, bring into the minds of young people a delight in life which I do not think any other kind of training will do. It is admirable all along the line, and of untold benefit.

I will give you an incident in a small way of how a little of that sort of training operated within my own personal and almost domestic experience. Before I came to America, in 1883, I had established in our own works a science school for our apprentices. We were then taking in boys of fourteen years of age, chiefly the sons of our working men, as we always gave our men priority for their sons, rather than strangers. I came to the conclusion, owing partly to the fact that these boys were somewhat demoralized by contact with men at so early an age, and partly to continue their education on practical lines, that I would make it a rule, not to be transgressed, that each apprentice coming to us at fourteen years of age must attend the science school connected with our works three nights in the week, — certainly three nights by compulsion. His time was taken by timekeepers at this school; his progress was noted just as it was at the workshops. We had a building of our own, and we brought into the science school appliances and patterns, parts of machines being made in the workshops. Mechanical drawing, freehand sketching and the natural sciences were taught, with their application to real objects, such as machines and various apparatus.

If any youth did not attend regularly and satisfactorily during the first year of his apprenticeship, he was discharged, sent back to his father; we could not do anything with that lad, — he had not taken advantage of his opportunities.

In a very short time that restriction became a dead letter. The boys were only too glad to attend the classes. The parents appreciated this, and the trade unions were gratified by the efforts on our part to train the boys scientifically.

During the intervening twenty years I have had a record kept of almost every boy who attended this science school and went through our works. Not one single failure has taken place; not one young fellow gone to the bad. They became trained engineers, very respectable men, got employment in various parts of the world; and when it was known that we trained young fellows in that way, government departments have written to me for likely young fellows for certain departments of the government. The Indian government has sent to me for young fellows to go out as working men, with some scientific knowledge of the occupations they are engaged upon, and with good moral character.

They have made a record all over the world, some of them became foremen, some managers, and some employers of labor themselves; and those who have remained working men have become men in very good positions, who have seldom changed their employment.

Mr. Wright. How many does that record cover?

We have as a rule about one hundred and ten apprentices, and we send out every year something like twenty or thirty. Taking the twenty intervening years, and there is a record of four hundred. This record relates to about four hundred young men whose careers I have kept in touch with, on purpose to find out the results of their training.

At the end of each year we had a prize distribution, and we gave books and instruments to the lads who had done well; and doing well meant that the report of the foreman of the department in which the boy was working should be equally good with the teacher's report in the school. It happened frequently that the boy who had shown more practical ability in the workshop, and who may have shown rather less advancement in the science school, still took a higher place at the prize giving, because he had shown greater resources to satisfy the foreman in the workshop by doing his work more intelligently than a boy who excelled in class subjects.

We also offered prizes which they could earn by displaying intelligent knowledge in the workshop. If any one during the year could suggest to the foreman any economy of time, any alteration of machinery, or any quicker plan of getting material into shape to be worked out, which the foreman said was good enough to be adopted, we gave the boy a five-pound note, as a recognition that he was making good use of his knowledge.

Mr. Wright. Do many employers in England have such auxiliary schools in their works?

No, I cannot say it is becoming a general custom. Of course it attracted a great deal of attention when it started, and some employers have done the same thing; but in recent years, since we passed the technical instruction act, a good many employers have subsidized the technical schools, to enable a number of these young people to attend a certain number of hours in the day time, instead of carrying on their own schools.

I have made up my mind now that next October we shall send all our apprentices to the two municipal schools we have now in Manchester and Salford, and make the attendance still compulsory.

Mr. Wright. What is the tuition paid in this Manchester institution?

In some cases they pay nothing, for there are many scholarships. The fees are very low. The session is from October to the end of May. I suppose they will pay probably in any case ten shillings for the term. It varies with the number of subjects taken.

Mr. Wright. Will it average that?

No, in some departments it might be a pound. When a boy comes with any intention for serious work, there are many free entrances provided, if necessary. We do not count much on fees. There is a certain revenue, and fees do not really make a large contribution towards the expenditure of these schools. The rate levied from the town is the chief source of maintenance, excepting in the case of sons of employers, and others who take a course of three or four years. They would probably pay for the instruction ten pounds for the term. They would have to pay, of course, for books and materials.

These schools are conducted on the easiest possible terms, to induce students to enter. We want to compel them to come; and no fee would be allowed to be a barrier, if the working classes would only send their children. If a youth wants the benefit of the school, he can have it whether he has money or not.

We have even some private arrangements made to subsidize parents to allow them to come. We have made proposals to some of our working people to send their sons to the technical school for two years before they come to us, and we are willing to help them to do so.

We have raised our age for apprenticeship from fourteen to sixteen years old. We did that to put compulsion on the parents; and the only schools they can go to after they are fourteen years of age are these industrial and technical schools, though in a few years we shall possess high schools.

While we are glad to help a needy parent, we do not want to pauperize them; we do not want them to conceive that they have a right to their boy's earnings until he is sixteen years of age. If there was any attempt to make a law against it, I would support it; but I prefer to see parents rising to a sense of their duty voluntarily, and, by changing public opinion among the working classes, to induce them to send their children for their own sakes.

Please take notice of what I said about the avoidance of teaching a trade to the extent of causing a lad to say, after leaving the industrial school, "I am a printer," "I am a cotton spinner," "I am a mechanic or a carpenter." In the first place, it is detrimental to the lad's own interests. He becomes somewhat conceited before he has got through the proper training by actual practice. It tends to deterioration of skill and intelligence in trades, which can only be fully acquired through work done on a commercial scale. It will tend to discredit industrial education.

Appendix No. 3.

ADDRESS BEFORE THE COMMISSION ON INDUSTRIAL AND TECHNICAL EDUCATION.

By Mr. E. Swaysland, Northampton, Eng.

It appears that the training of the workman, apart from factory life, has had more attention in England than in this country. We found that present-day conditions do not make towards producing intelligent workmen; that the workmen were becoming mere machines; that they were not receiving that thorough training obtained under the nearly extinct apprenticeship system; and that there was little prospect of filling the positions of foremen and managers, now held by men of experience, with men of equal ability.

Naturally, there have been differences of opinion respecting the best form of supplying this supplementary training; but discussions of that kind may be left to those dealing with the principles of education. My special subject is boot and shoe manufacture; I propose laying before you the results of experience as a working teacher.

As a matter of fact, we have been teaching practical boot and shoe making in England for a great many years, in I should say about four hundred schools, mostly to boys who have been punished, or should be punished for some offense.

After a considerable number of years it was discovered that the purely practical teaching was really not having any beneficial effect upon the mental equipment of the boys, and that the training given was not sufficient to make good shoemakers. About 1900 I was asked to write a syllabus that would help the teachers to give instructions that would exercise the boys upon their intellectual side, without in any way interfering with the practical lessons. I did so, and I am pleased to say that I received a letter just before I sailed, saying the effect on the schools had been beneficial. The boys are now showing some signs of an intelligent interest, outside of the mere mechanical work.

In leather manufacture we have two schools in England, — the Yorkshire College at Leeds and the Herolds Institute in London, — both of which teach the principles and some of the practice of leather manufacture. I am pleased to be able to say we have in the English schools, among a cosmopolitan lot of students, a gentleman from America, who has been studying leather manufacture for some years. I believe he has returned to America now. In addition to these schools, several institutes hold evening classes in leather manufacture.

Evening classes in boot and shoe manufacture have been held for about twenty-three years. The pioneer class was commenced at the London Regent Street Polytechnic, and the tuition consisted mainly of lectures, although there was a strong feeling at that time in favor of purely practical instruction. After the first session this pioneer class was held under the direction of the City and Guilds of London Institute for the Advancement of Technical Education.

I should like to state here that the growth and success of evening technical classes, of all kinds, in the United Kingdom, is largely due to the influence of the City and Guilds of London Institute, which I consider to have had a most beneficial effect upon technical education, although the classes under my control are not under the supervision of that institute.

After the first few years an effort was made in some directions to make the tuition in evening classes partake of the character of instruction in practical work, and to induce the student to undertake exercises in manipulative processes, although experienced educationalists never quite supported the principle.

After a few years it was found that it was not possible to make a workman in an evening class. That is one of the points I wish to emphasize. We have discovered after several years of teaching that it is not possible, except at enormous cost, to provide sufficient exercise to enable an unskilled man to become a workman in an evening class. The amount of time which you have to devote, to give him the opportunity to acquire the skill, is not available for evening teaching. There appears to be a general opinion in England that the best results are obtained by lectures and demonstrations by practical experts, with sufficient exercises to enable the student to experience personally the practical effect of the application of the principles taught.

There are, altogether, twenty-one centers at which evening classes in boot and shoe manufacture are held; seven of these are under the direction of the Education Committee of the Northamptonshire County Council, with Mr. J. L. Holland as organizing secretary, and are taught by me, with the assistance of about fourteen instructors and demonstrators.

A special committee is formed for boot and shoe manufactures, consisting of members of the County Education Committee, and representatives of the Northampton Technical School. This joint committee is formed of members of the shoe and leather trades, representing different branches of the manufacture, and one representative of labor.

Each center has a local committee, which is expected to manage the details of the class for their center. We have adopted a rule that, wherever the local committee requires any specific teaching, we provide it. In most of the schools the fee which is paid by the student for the subject of boot and shoe manufacture pays for lessons in science. For instance, at four of our centers — Northampton, Wellingborough, Rushden and Kettering — we teach freehand drawing, model drawing, plane geometry and machine construction, and a few other minor sciences. We allow the student to take up some of them, either without further payment or at a reduction, and we find they are much benefited by it. They are better men as citizens, and they are better men in the factory.

The financial aspect is a somewhat complicated subject. The revenue is represented by a special education rate raised by the county. Originally we were supported by the whiskey money, as it was termed; that is to say, the duty upon whiskey was paid over for technical instruction; and I am sure we were grateful to the whiskey drinkers for a while, but now payments come from the ordinary educational rate. In addition to that, the Board of Education makes certain grants. Our Board of Education represents your national government. They decide at what rate the schools should be supported by the government. If simple mechanical work is taught, the grant may be from two shillings and six pence to three shillings and six pence per head. If you teach the principles of a trade, as well as the practice, the grant may go from 13 shillings to 25 shillings per head, but there are some definite restrictions in the matter. You are not allowed to give less than forty minutes to each lesson to one and one-half hours to practical work. There should be not less than fourteen hours of instruction during the session. The evening class is expected to be held some time after 4 o'clock on ordinary evenings, and 1 o'clock on Saturday.

I might also mention that the Board of Education provides for technical institutes in day classes. They expect that at least a two years' course shall be arranged in science and art, in conjunction with some technical subject; that is to say, if you teach the science and art of a subject, and you teach the practice of it, you must not teach less than one hour per day nor more than six hours per day; and the grant may be from six pounds for the first year to eight pounds for the second year. If a student is attending a workshop, and also attends the technical school or a separate day school, the grant allowed is from two to three pounds.

I have no doubt this appears very indefinite, but, as a matter of fact, all these questions are decided by the inspectors. If the inspectors consider the school is a well-equipped school, that the students are being taught intelligently the principles of their business, and are being taught the practical details, they will give an extra grant. If they find there is anything missing in the tuition or equipment, they may reduce it, and not pay anything at all; therefore, it depends entirely upon the value of the training. At the same time, the inspector expects these local committees or their representative to be responsible for the tuition; that is they expect some member of the committee to visit the classes, listen to the lectures, inspect the schools, and see that they are kept up to the requirements.

There has been a great deal done during the last few years towards elasticity in the teaching of technical subjects. We have found that, if they are manufacturing shoes of the heaviest kind in one district and of the lightest kind in another, the teaching must be adapted to each place separately.

In the scheme which I have produced, and which I am working under, I endeavored to do that. I may say that I am a practical shoemaker, and I assume that in the boot and shoe trade, as in any other trade, there are some matters that every person who claims to be an artisan should know. In the shoe trade there are some general subjects which every intelligent workman should be acquainted with. We do not say to the artisan students, You shall be acquainted practically with the whole trade; but we say, There are some things in the shoe trade that, if you claim to be an intelligent worker and desire to advance, you should be acquainted with. We have put those subjects in a general section.

At the same time, we say there are also some subjects in which you will, no doubt, wish to qualify as a practical man and get your living by. We allow you to select any one of these special divisions, but we do not teach you any particular operation by itself. For instance, if a young man wishes to qualify as a laster, we should not permit him to be taught only how to tack a shoe upon a last. We should expect him to show that he understood thoroughly the principles upon which it should be done, and the effect upon subsequent operations. We do the same with each branch of the trade.

We have divided the first year, or elementary stage, into a general section and five divisions. If a man wishes to qualify in our next stage, the advanced stage, we say, The general section you must take up, but if you wish to be a high-class man, we expect you to have a greater knowledge of some practical divisions. Therefore, we divide the advanced practical division into four, and the man who was recently qualified as a laster and attacher will have to qualify as a bottom stock cutter and laster. When he succeeded in this second course he would be a practical laster, and would also have a practical knowledge of bottom stock cutting and of attaching.

The third-year course is intended for those who wish to qualify as managers and designers. It is made somewhat difficult. The general section covers practically the whole of the trade except management and design. The design covers all kinds of designs. Management covers all classes of material, relative cost of labor, arrangement of factories, checking of labor, interest on capital, and all matters that go to the management of shoe manufacture. The successful man in this stage is a high-class man.

The student seldom gets through these three divisions in three years. It is arranged for three or more years, and we find it very rare indeed that a man gets through in three years. I may say I have one man in Kettering who has qualified very high, but who has attended the classes for twelve years, and he has just succeeded in getting through in the highest position.

We have in England a quite comprehensive series of examinations, which are closely connected. Of course it leads to another matter, concerning the value of which there is a grave difference of opinion. I know that in America you do not much favor examinations. We are not too favorable to them in England at the present day, but there is a great deal to be said for them. A great many men may join a class and attend that class for a year or two, and never concentrate themselves very much to do anything; a man of this class will nominally go through the whole course. At the end of two or three years he may go out, and be more or less satisfied, but he will be no credit to himself or his teacher. If we say to that man, We cannot permit you to attempt the advanced stage until you have passed the elementary stage, — if that man desires to be admitted into that advanced stage, he will acquire the necessary knowledge. There are a great many men who need that spur. And then, again, we find that the men who have sufficient application, and sufficient spirit, and sufficient snap, — to use that expression, — to get well through an examination, apply the same energetic influence to every-day life. The man who is utterly worthless in the examination room is generally utterly worthless in the workshop.

We divide the examination into a theoretical side and a practical side; that is to say, the student answers certain questions upon the principles of the business, in writing, and then a few days afterwards he has to apply those principles to practice. If he wishes to qualify as a pattern maker or as a laster, he first attempts the written examination, and then attends at Northampton, and does four hours' work in an ordinary workshop upon ordinary work. The marks made in the two tests are put together to decide his position; he has to make one hundred and twenty marks at least for a pass. He may make seventy-five marks for the practice division and fifty marks for the theory, or *vice versa,* but he must make the proportion of each to get through. If he succeeds, he is awarded a certificate notifying that he has passed in the principles of his trade, and as a practical laster, or whatever he may be. Quite commonly he takes that certificate when he applies for a position, and it has a considerable influence upon the employer in the selection.

As regards method of teaching, as I mentioned, we require a great deal of elasticity in the teaching, according to the class of work and the class of employees. In Northampton we teach two evenings per week. We do not instruct in any branch of practical work, but devote the time of three and one-half hours to lectures. The Northampton workmen are skilled men. We have more than a sufficiency of workmen in that district, and we do not wish to have any more. In Wellingborough conditions are altogether different. Skilled labor in some directions is in great demand, and therefore we devote six hours per week to practical exercises and only three hours a week to what we call theory, or teaching the principles of manufacture.

At Rushden we give two and one-half hours to practical work and three hours to lectures. At Raunds we divide it equally, two hours to each; and so on, down the list; there is a considerable variation in the teaching among the different places. If the local committee consider that their particular place requires a larger amount of practical teaching, we provide it, but we will not give practice tuition alone. This is one point we always make. We say, If we give you practice tuition alone, we cannot do any more than produce the same class of workmen that you have already; and our object is not to do that, but to raise the status of the man, to give the boy that is coming on an efficient training, and to give the man who has probably missed educational opportunities some opportunity of supplying that which he has missed.

The number of students who have passed through the classes during the last few years has varied between one hundred and seventy-nine at the lowest to three hundred and two as the highest number. I found that in 1901 the class went down in number to one hundred and seventy-nine. Under my own special syllabus they increased to three hundred and two.

I would like to deal with this question of numbers. We have never endeavored to secure a large number of students, which may appear rather strange. That has been one of our points. We do not wish to allow any person of very moderate capacity to claim to have passed through our classes, or to claim some extra consideration for it. We say these students should be the best of their class; and therefore we take some care in the admission of students to high tuition, either by some examination, or by other means personal to myself. We have never made an effort to secure a large number of students, but the record shows that our students distinguish themselves in after life.

Out of one hundred students, taking them without selection, no manufacturers, retailers or managers entered these classes; but twenty-nine of them have become manufacturers, or retailers, or managers, since they attended the classes. I find that thirty-seven of this one hundred have become pattern makers, although they were upper stock cutters before they joined the classes. We had two clerks and one traveller, which I think you call a drummer. I find we have now two drummers and one clerk. I do not quite know whether that represents any increase in position in America; it does not mean very much in England. There were nine bottom stock cutters, but only one has remained in that position. The bottom stock cutters have evidently become managers, or retailers, or manufacturers.

Some of you may know the names of Mr. Walter J. Lewis of Northampton and Mr. Albert Marlow of Northampton. They are both old technical students, and are rather proud of the fact. I could quote quite a large number of men who have attained very good positions since they attended. I have selected a few statements from some letters. One student who attended the classes is now a pattern maker. This is his experience: "I received eighteen months' private tuition without benefit. I then joined the classes, and have become a pattern maker, which was my ambition."

Mr. Chapman of Kettering, who was originally a laster, writes: "The knowledge obtained has been of great benefit to me in boot and shoe manufacturing." The next man, who was a clicker, and is now a manager, thinks an ounce of theory saves a ton of practice. In his letter he says: "I have often been told that an ounce of practice is worth a ton of theory. All I can say by my experience is that an ounce of theory saves a ton of practice."

I have also two men who have become teachers and professors since they attended the classes, and the others are foremen, managers and contractors. One man sent a list of eighteen men who have benefited from these classes.

There appears to be an opinion among a certain class of men that no man should be allowed to be taught more than one branch of a trade, or, indeed, more than one process in a branch. This idea appears to be the outcome of a confusion between the teaching of several distinct trades and that of subdivision of one trade. Of course it is ridiculous for any one to assume that no man should ever be anything but what he is at present. I mean, by that, if we say this man, being a pattern maker or an edge setter, should not be taught anything else, we place that man in precisely the same position as the Hindu, who is born to be a mat maker, or whatever he is born to be, and he must not do anything else. That is an impossible position for an American to take up, — to say that a man, no matter what his position, shall not be taught anything else. We have always encouraged them to take some other branch, — preferably some branch which has a connection with their work, — with the idea that it benefits the man and the community. We assume that an edgetrimmer, who shapes the edge of the shoe, would be a far better edgetrimmer if he understood something of the setting of the edge. We assume that a man who is a pattern maker should also be something of a cutter, and also something of a laster; certainly he should have some acquaintance with it. Therefore, we say, if you are taking up this branch that represents pattern making, we expect you also to take up those branches which are subsequent to it. At the same time, we will not take a man from the street and make him a shoemaker. That is not our object.

Our object is to take the men we have, and make them better shoemakers.

The young boy coming into the business requires a somewhat different plan. Most employers agree that there is not sufficient time in the factory, under present conditions, to teach a boy the business. We may make the boy a machine, or make him part of the machine, but we are not raising him intellectually, and we are not doing him very much good, if we desire to make him a shoemaker. And from a shoemaker, and a shoemaker only, can you expect to form a superintendent of the factory. If you keep a boy to one process, you make him a machine minder, but not a shoemaker; and as he advances in life he cannot become competent to take a position of any importance, because his knowledge is not sufficiently wide. We, therefore, endeavor to make the rising generation shoemakers, and capable of taking positions in the future. This is the idea which I shall endeavor to carry out when I get back. I shall propose that, if we start any new school, that school will take apprentices for a portion of their day, representing a part of their day's work. If the employee works during the morning three or four hours, then he will spend three or four hours in the technical school workshop, being taught the principles, in the afternoon or evening. That would take him along on two sides: on his physical side, while he is taught manual dexterity; and on his intellectual side, while he is taught some of the science applied to shoemaking.

After visiting your factories and comparing your position with our experiences, it appears to me that we have arrived at the same position by different routes. We have arrived at the conclusion that we need day schools for the rising generation. There is no doubt about it. The average boy in the shoe factory to-day reaches that factory between sixteen and seventeen years of age; he may reach it a little earlier. He gets into my class room at about eighteen or nineteen. I say to the boy, "Have you any knowledge of science?" "Oh, yes," he says, "I passed some examination very well." I ask, "What can you do?" I find he can do nothing whatever. Between the ages of thirteen, fourteen or fifteen, and the ages of seventeen or eighteen, that boy has forgotten most of the education the State has paid for, and he comes into the class room at eighteen or nineteen almost destitute of education. This is a waste of public money. It is one of the things we are most exercised about in England. We propose to have schools to carry these boys over from fourteen to eighteen or nineteen; and you appear to be in the same position.

I have produced a scheme which appears to me will meet your requirements. I suggest that you call the schools proposed "Co-ordinated Schools of Industry." I took some care with the expression, as I have the idea that most of us are more frightened by words than by effects, and the wrong term might have more effect than all my arguments. I propose that you have day schools, which you call industrial colleges, for youths from fourteen to eighteen years of age. These boys might, according to local custom, spend some of their time in the factory, or spend the whole of their time in the school. I propose the tuition be divided into a four years' course; that the first year should be spent in a continuation of their education, especially directed towards the business they are going to take up. In my experience with technical colleges, I am afraid they spend too much time in general science, and not enough in the application of science to the industry that the student is going to follow, and therefore they turn out men equipped in general knowledge, but without any particular application. I propose you commence teaching practical drawing, chemistry and physics, in their application to boot and shoe manufacture; that the first year should be more or less general, upon principles; that the second year shall be devoted to practical applications of science; the third year to applied technical chemistry, or drawing; and that the fourth year be devoted to practical work, or advanced practical applications of science to the particular trade. The student would be trained as a designer, or a pattern maker, or in hand processes connected with boot and shoe manufacture, or in machine processes; or, if he is trained for tanning, in analysis, etc.

I should think it would be a very fine thing if you could establish about three of those day schools in Boston, Brockton, Lynn or other central places. Those schools would act as centers for the outlying districts. At your outlying districts you could establish evening classes. The students who attended the evening classes in the outlying districts should be permitted to attend the central schools in the evening, where you would hold special evening classes for them. The first-year student in the evening school, who attended the general section in practical work as a pattern maker, would be permitted — with an extra charge, or without, as you please — to attend the practical geometry and free-hand drawing at the central college. This would be continued right up to the third year; and in the third year, or when he should take design and management, the average student would be allowed to attend lessons in technical chemistry, or technical drawing, or in bookkeeping.

That represents the scheme which, of course, includes the establishment of central schools in central districts and evening classes in outlying districts. The outlying districts would be controlled by the local committees, who would decide what class of teaching was suitable for them. The student might join the local evening class, and, if he was ambitious and wished to qualify, he might attend the central school for his science. It appears to me that by this system it would be possible for a man to qualify for any position.

As regards examinations, I think this might be left to your own discretion. Personally, I am rather in favor of examinations, and I do not quite see how you could test a student without. The students who desire to take up a course of general science should be expected to pass some examination in general education.

Mr. Wright. Are the schools with which you are connected carried on under the act of 1889?

Yes; I commenced the classes in 1890.

Mr. Wright. Do you get the benefit of the penny in the pound assessment, and of the whiskey revenue, for the support of your schools?

Yes.

Mr. Wright. What is the tuition?

As a rule, the average charge is two shillings and six pence. In a few places, where we teach science in rather a more extended way, we charge five shillings. That is for six months.

Mr. Wright. What is the attitude of the employers themselves towards your work?

If a man studies his business in his leisure hours, and becomes a better man for it, which he does, the first man to get advantage is the employer whom he works for, and, therefore, they prefer to have these men. They are friendly to the schools.

Mr. Wright. How about the trade unions?

They have no objection. There was some objection at one time; they were afraid we should produce shoals of partly skilled work people, who might supersede their highly skilled men. That is a thing it is not possible to do, and it is a thing I certainly would not do, or encourage, because the object is not that. The object is to improve the status of the rising generation, and to improve the status of the present work people.

Mr. Wright. You told us in the beginning that you invited committees to meet in the beginning of this enterprise. What do you mean by that?

The County Council appoint an Education Committee, which would represent your State Education Committee. They have formed a special committee on boot and shoe manufacture, which I have mentioned. The interested person should apply to the secretary, stating that there is probably a necessity for a boot and shoe class in a certain place. I make a personal investigation, and if I think there is need for it, I notify the secretary, who invites some prominent person in the district to form a local committee. They appoint a secretary, who confers with the organizing secretary, and we make the arrangements.

Judge Reed. What is the Board of Education?

Our Board of Education would represent your national Board of Education, and they have the control of the whole of education in England. We cannot do anything without their permission. They make special grants to improve the schools. You may own schools if you will, but they may refuse to support them. They may make you these grants, but they have a right to close your schools.

Judge Reed. I wanted to ask further about the interest of the young men themselves in this work. Do you find that they care to take it up?

This is the position: we find that the student takes it up with the idea that it is about the only possible means of advancing his position as a shoe worker. He appears to have arrived at this conclusion: that, so far as the factory is concerned, there is no possibility of his ever being anything more than a worker upon some division of his trade. If he gets into the factory as an edge setter, then an edge setter he is likely to be, unless he attends the technical school. Whatever branch he gets into, he is doomed to that. Therefore, he attends the technical school to gain an opportunity to strike out in some other direction, or to get a high position; so you see we attract only those men who are anxious to better themselves in their work.

Mr. MURPHY. Do you take boys in who have never worked in shoe factories?

No.

Mr. MURPHY. Suppose a man working on a poorly paid branch wants to learn to run a Goodyear machine?

If a boy or a man is engaged in any part of a shoe factory whatsoever, that entitles him to take up any branch he wants. The only restriction is, he must be employed at the time by some shoe manufacturer. Then we take him in, and teach him whatever he likes.

Mr. MURPHY. Is there any restriction as to how long he shall attend the school?

It depends entirely upon his ability to learn the part he wants to learn.

Mr. MURPHY. I understood you to say, Mr. Swaysland, that, if a man wanted to learn pattern making, he would also have to have a general idea of lasting and cutting, in order to make him an expert pattern maker; and that rule applies to all branches.

Yes; that is so.

Mr. MURPHY. Where do you get the shoes the men work on?

They are usually provided by manufacturers, or by the education authority for examinations.

Mr. GOLDEN. I read an article some time ago from England on this matter, and it stated that not only were the labor unions favorable to these schools, but they also at different times had given prizes or premiums for successful students. Have they done that in your shoe business, that you know of?

I do not recollect it. I think the writer confused the labor unions with the co-operative societies. These are largely represented by workingmen in England, and quite commonly give valuable prizes. The trade unions, to my knowledge, have never done so. The co-operative societies have certainly given large sums of money.

APPENDIX NO. 4.

LETTER TO THE COMMISSION ON INDUSTRIAL AND TECHNICAL EDUCATION.

BY CHARLES F. WARNER, SPRINGFIELD, MASS.

In compliance with your request, made at the hearing given by the Commission on Industrial and Technical Education, at the Board of Trade rooms, Springfield, October 18, that I should put in writing such facts as I wished to state, with my recommendations, I have the honor to submit for your consideration (1) a brief description of the Springfield Evening School of Trades, (2) some statistics showing certain features of industrial conditions in Springfield, (3) a report of what the school has accomplished for some of the men who have attended it, (4) a few suggestions upon the general question of trades teaching, looking toward a feasible plan for carrying out the recommendations of Governor Douglas.

THE EVENING SCHOOL OF TRADES.

In the fall of 1898, a few weeks after the organization of the Mechanics Arts High School of Springfield, now known as the Technical High School, the school committee then in power, upon the recommendation of Superintendent Thomas M. Balliet, voted to organize night classes for giving instruction in certain mechanical trades for which there was a local demand, and for which the new high school could furnish the necessary equipment and teaching force with little additional expense. A beginning was made with classes in machine shop practice, tool making and plumbing. These classes have been successfully maintained for seven years; and from year to year the work of the school has been extended, until it now includes, besides those just mentioned, classes in pattern making and other wood work, in mechanical and architectural drawing, in shop mathematics and in electricity. It should be said that the mechanical drawing department was formed out of the free evening drafting school, which, in accordance with the State law, had been maintained for twenty-seven years. The courses laid out for these several departments are as thorough and complete as it is thought possible to make them in an evening school. The attendance during the season of 1905 was about 300 each week, and was remarkably constant. The percentage of attendance during the same term was 84.4, which is far better than that of most night schools.

The object of this school, as stated in a recent report of the school committee, is "mainly to give men already employed in the trades, who know, therefore, at least a part of the trade in which they are employed, an opportunity to broaden their mechanical training and make themselves more efficient workmen. It is not the function of this school to train apprentices as such, but to supplement the imperfect and highly specialized training of modern shops, by giving machine hands, helpers and apprentices, so far as there are any apprentices, an opportunity to gain practice in a greater variety of work than would ever be open to any one man under the modern system of machine production. The aim of the school is to enable a mechanic to acquire a wider range of practical knowledge, to improve the quality of his work, and thus to reach a higher classification in his trade, with increased wages. This is a great advantage to the individual workman; but it does not materially affect the condition of the labor market in general."

It is a public school. Tuition is free, but a fee of $5 is charged, which defrays the expense of materials used, and serves as a guarantee of good faith on the part of those enrolled. The per capita expense was, in 1904, $15.21, allowance being made for the incidental fees. It is a popular school, and the various city governments since its organization in 1898 have promptly voted the necessary though moderate appropriations for its maintenance. While its existence is due almost wholly to the fact that the equipment of the Technical High School was easily available, it has returned to that school an equivalent — probably much more than an equivalent — in helping to attract public attention to the value of practical training for high school boys, in justifying the cost of thorough technical training and the expense of its development along modern lines, and in actually saving several hundred dollars annually through the value of tools and machines made for use in the day school. It may not have been necessary thus to justify the maintenance of technical education in the city's high school system; but the influence of the Evening School of Trades has certainly been helpful in this direction. In fact, both schools have felt the advantage of mutual support.

The character of the membership in the Evening School of Trades and the methods employed make it, for the most part, a kind of shop continuation school. Its pupils are largely men already employed in the trades, who wish to improve their knowledge of the trade they follow, or perhaps fit themselves to take up a more profitable one. Its office is to supplement and facilitate the shop training, and to enable mechanics to do a higher grade of work. For this reason it receives the support of employers of labor, who welcome any means whereby their men may be trained to do a better quality of work. It appeals to the men themselves, whose shop training has for the most part been limited to narrow lines, because it opens the door to a wider range of practice, to a broader knowledge of the trade, and consequently to promotion, with higher wages. It is not opposed by the local labor unions, because, while manifestly advantageous to individual workmen, it evidently cannot, however much it may be extended along present lines, operate to increase materially the number of men employed in the trades taught, and thus lead to a reduction of wages.

In order to test the value of the work of this school to those who have attended it, I sent out, a few days before the hearing which your Commission held in Springfield, inquiry blanks to about 100 of the recent members of the school who could easily be reached, with the following result: —

	CLASSES.				
	Mathematics.	Machine Shop.	Mechanical Drawing.	Wood Work.	Plumbing.
Number of replies received,	18	28	22	8	4
Purpose in entering the school: —					
1. Increased experience,	10	17	14	2	3
2. Advanced classification,	13	20	17	5	2
3. Change of occupation, .	1	22	6	5	1
4. Advance in wages,	9	25	13	4	2
5. Other reasons, . .	3	2	6	3	2
Number receiving direct benefit from instruction in the school,	18	28	22	8	4
Greatest increase in wages (per day), .	$1 25	$2 00	$2 00	$0 50	$2 00
Least increase in wages (per day), . .	25	25	25	30	1 50
Average increase in wages (per day), .	68	88	1 12	45	1 75
Age limits (years), . .	19–39	19–40	18–42	17–37	21–28
Average age (years),	27	27	28	24	25

From this report it appears that every man who answered the inquiries acknowledged that he had received direct benefit from the instruction which he had received in the school. It would, of course, be expected that he would receive the benefit of instruction, but the increased knowledge or skill was invariably recognized in increased wages. Not one of those who answered the inquiries had failed to receive an increase; 6 had received an increase of $2 per day; 5, $1.25; while the average increase in all classes was no inconsiderable sum. I have no doubt that a more extended inquiry among the 500 men who have attended this school, if it had been possible to make it, would sustain the inference that must be made from the replies of these 80 men.

A few instances will serve to indicate the general character of the advancement made by mechanics who have attended this school. Two years ago a man twenty-six years of age, employed in a machine shop at $1.10 per day, entered the evening class in mechanical drawing. After a little more than one year he was recommended to the position of assistant foreman of the Densmore Typewriter Company, and secured the place at $2 per day. He has advanced rapidly, and is now holding a responsible position at $21 per week. He gives the school credit for making his success possible.

Another young man, twenty-one years of age, who attended the school the same year, having had some experience as a subordinate in a drafting room, is now, as the result of training received in this school, in charge of the designing of tools and fixtures for a large automobile company, at a salary of $25 per week. No less than 50 instances of similar advancement have come under my personal observation. A considerable number of men at the United States Armory have profited by the advantages which the school offers. I recall one whose rating was nearly doubled after a brief course in our machine shop.

Three years ago a more comprehensive inquiry was made, to ascertain the facts as to the age of the men enrolled, their previous schooling, their residence, their occupation or trade, their classification in their trade, — *i.e.*, the subdivision of the trade in which they were engaged, — and their length of service under this classification. The results of this inquiry were published in the annual report of the superintendent of schools for 1902. The statistical facts ascertained were tabulated, and these may be of interest to your Commission, since they throw some light on several phases of the problem of teaching trades at public expense. These statistics, with certain observations upon them, made at the time of their publication, follow: —

Table I. — *Attendance.*

	Classes.						
	Mechanical Drawing.	Machine Shop.	Plumbing.	Pattern Making.	Electricity.	Mathematics.	Totals.
Enrollment,	120	98	19	20	32	22	311
Average number belonging,	102.8	89.8	16.2	16.4	27.2	19.4	271.8
Average number attending,	87.1	79.2	13.2	14.7	24.1	17.3	235.6
Per cent. of attendance,	84.6	88.2	81.5	89.5	88.4	88.7	86.8

Table II. — *Age.*

	Classes.						
	Mechanical Drawing.	Machine Shop.	Plumbing.	Pattern Making.	Electricity.	Mathematics.	Totals.
Average age,	22.0	23.8	22.3	24.3	26.8	22.8	23.7
Number below 21,	62	46	9	9	13	11	150
Number above 21,	58	53	9	11	19	11	161
Age of youngest,	15	16	16	15	15	17	15
Age of oldest,	54	51	39	50	50	45	54

Table III. — *Education.*

	Classes.						
	Mechanical Drawing (Per Cent.).	Machine Shop (Per Cent.).	Plumbing (Per Cent.).	Pattern Making (Per Cent.).	Electricity (Per Cent.).	Mathematics (Per Cent.).	Totals (Per Cent.).
Graduated from high schools,	3.3	6.0			7.0	14.0	
Attended high schools without graduation,	23.2	30.0	21.0	20.0	20.0	33.0	
Graduated from grammar schools, but did not attend high school,	23.9	23.0	32.0	11.0	27.0	21.0	
Completed eighth grade,	31.5	23.0	37.0	42.0	32.0	22.0	
Completed seventh grade,	9.9	10.0	5.0	20.0	12.0	–	
Completed sixth grade,	2.4	6.0	–	7.0	2.0	7.0	
Did not complete sixth grade,	5.8	2.0	5.0	–		3.0	
	100.0	100.0	100.0	100.0	100.0	100.0	

Table IV. — *Residence.*

	Classes.						
	Mechanical Drawing (Per Cent.).	Machine Shop (Per Cent.).	Plumbing (Per Cent.).	Pattern Making (Per Cent.).	Electricity (Per Cent.).	Mathematics (Per Cent.).	Totals (Per Cent.).
Five years or more in Springfield,	35.5	21.0	58.0	53.0	17.0	11.0	
Between one and five years in Springfield,	40.5	39.0	11.0	10.0	43.0	43.0	
Less than one year in Springfield,	24.0	30.0	10.0	32.0	40.0	46.0	
Non-residents attending,	–	10.0	21.0	5.0	–	–	
	100.0	100.0	100.0	100.0	100.0	100.0	

TABLE V. — *Occupations and Classification. (Total Number of Occupations represented, 58.)*

	CLASSES.						
	Mechanical Drawing (Per Cent.).	Machine Shop (Per Cent.).	Plumbing (Per Cent.).	Pattern Making (Per Cent.).	Electricity (Per Cent.).	Mathematice (Per Cent.).	Totals (Per Cent.).
Machinists,	4.9	9.0			3.5	–	
Tool makers,	2.5	1.0	–	–	–	7.0	
Machine hands (machine shop),	19.8	50.0	5.0	10.0	21.0	32.0	
Pattern makers,	–	–	–	–	–	–	
Carpenters,	13.5		5.0	42.0		3.5	
Cabinet makers,	.8		–	–		–	
Machine hands (woodworking shop),	-	1.0	1.0	10.0		–	
Licensed plumbers,	.9		–	–	–	3.5	
Helpers,	23.9	–	20.0		7.0	7.0	
Apprentices,	–	11.0	10.0	–	–	–	
Laborers,	2.5	2.0	–	16.0	–	–	
Clerks,	7.2	5.0	36.0	–	10.5	7.0	
Engineers,	–	–	–		17.0	16.0	
Draftsmen,	4.0				–	11.0	
Electrical workmen (general),					20.0	–	
Wiremen,	–	–	–	–	5.0	–	
Unclassified,	14.1	19.0	16.0	11.0	16.0	13.0	
Unemployed,	5.9	2.0	7.0	11.0	–	–	
	100.0	100.0	100.0	100.0	100.0	100.0	

TABLE VI. — *Length of Service as classified.*

	CLASSES.						
	Mechanical Drawing (Per Cent.).	Machine Shop (Per Cent.).	Plumbing (Per Cent.).	Pattern Making (Per Cent.).	Electricity (Per Cent.).	Mathematice (Per Cent.).	Totale (Per Cent.).
Ten years in same classification,		6.0	–	5.0			
Five years in same classification,		11.0	10.0	32.0			
Four years in same classification,		6.0	5.0	6.0			
Three years in same classification,		18.0	10.0	6.0			
Two years in same classification,		15.0	15.0	16.0			
One year in same classification,		22.0	32.0	31.0			
Less than one year in same classification,		22.0	28.0	4.0			
		100.0	100.0	100.0			

TABLE VII. — *Object in taking Course.*

	CLASSES.						
	Mechanical Drawing (Per Cent.).	Machine Shop (Per Cent.).	Plumbing (Per Cent.).	Pattern Making (Per Cent.).	Electricity (Per Cent.).	Mathematice (Per Cent.).	Totals (Per Cent.).
To advance classification without changing trade,	2.5	69.0	53.0	53.0	30.0		
To change occupation to trade taught,	9.9	9.0	47.0	5.0	23.0	–	
To obtain general information,	87.6	22.0	42.0	42.0	47.0	100.0	
	100.0	100.0	100.0	100.0	100.0	100.0	

"A comparative study of the statistics given in the foregoing tables reveals several interesting facts. Nearly one-half of the men were enrolled for instruction in the strictly mechanical trades, somewhat over one-third in the mechanical drawing classes, and the balance in the classes in electricity and mathematics, in which the instruction is of more general value, though it finds, for the most part, special application in the occupations of those enrolled in these classes. In all the classes the per cent. of attendance is unusually high, — probably much higher than in that of any other evening school. These facts indicate that those who come to this school not only have a distinct object in view, but also find the instruction valuable enough to hold their interest to an unusual degree. The school appeals to mature men as well as to minors, as is shown in Table II.

"Some interesting facts in regard to the previous education of mechanics are brought out in Table III. Very few have completed a high school course, and yet a considerable number have entered high schools, — in round numbers, 25 per cent. of those enrolled for instruction in the trades. About the same number have graduated from grammar schools, but did not enter high schools. Taken together, these statistics show that about half of the mechanics enrolled in this school were qualified for a high school course of some kind, but they did not take it. This fact raises the question whether a more general introduction of industrial teaching in high schools would not stimulate a longer high school attendance on the part of boys who intend to follow mechanical trades. But the table also shows that a large percentage, particularly in the plumbers' trade, did not complete the grammar school course. A complete system of industrial education ought, therefore, to begin somewhat earlier than the ordinary high school age.

"Tables V. and VI. call attention to the graded subdivision to which the modern system of specialization has subjected the mechanical trades, and to the length of service in the various divisions. Long practice in a limited field of mechanical operations develops skill, which is an essential in the development of a system of rapid production. This policy is wise from a strictly commercial point of view. Its effect, however, upon the workman is inevitably narrowing, since it leaves him small chance to learn a complete trade, or even a considerable part of a trade. The apprentice system, such as was in vogue before the present era of intensified production, is practically impossible. The only way to provide broad education in the mechanical trades, and to enable mechanics to gain sufficient knowledge to advance their classification, is to provide trade schools. Table VII. shows that nearly 70 per cent. of the men enrolled in the machine shop are seeking a broader training than they are able to obtain in the shops in which they are employed."

It may be objected that such a school as I have described is not a thorough-going trades school, and that complete knowledge either of the mechanical or of the building trades cannot be given through instruction in night classes. There would be some value in this objection if an attempt were made to teach trades to apprentices by means of such brief practical courses of instruction as could be given in an evening school. But if the school is open only, or for the most part, to those who are employed at the trades during the day, and who wish to increase the mechanical knowledge and skill which they already possess, the objection is not to the point. I have called it a shop continuation school, and, with the exception of a small number of apprentices in the machine shop and plumbing school, that is what it really is. As such it has demonstrated its value to the industries of Springfield and to the workmen themselves. If the experience of Springfield proves anything, it seems to me to prove that any industrial community, in which there is a well-equipped manual training high school or shops that may be made available for night classes, may easily secure a similar extension of its educational system.

Turning now to the question of establishing day trades schools for apprentices, we find it involves very different and somewhat difficult problems. But it is the chief question at issue. The Commission is undoubtedly aware of the feeling among industrial leaders that such schools are needed, and that the industrial development of the State will be seriously retarded if provision is not made in some way for teaching apprentices. It cannot escape the notice of any student of industrial education that the people of the United States, especially the people of Massachusetts, are extremely backward in appreciating the need of laying strong educational foundations for the improvement of present industries and for the development of the industries of the future. Our conservatism in this matter, in contrast with the educational enterprise of many foreign governments, is well understood. The example of Germany has often been referred to; and, while the German States present somewhat different conditions from those found in Massachusetts, the extensive system of industrial and technical education of the Empire may well be kept before us as a perpetual example.

The late Dr. Thurston of Cornell University estimated that, in order to educate the people of the United States in technical and industrial lines to the extent that the people of Germany are thus educated, we should need in the United States "22 universities, having in their schools of engineering and higher technics 50 instructors and 500 students each; 50 trade schools and colleges, of 20 instructors and 300 students each; 2,000 technical high schools or manual training schools, of 10 instructors and 200 pupils each. That is to say, there should be in the United States to-day 1,100 university professors and instructors and 11,000 students studying the highest branches of technical work; there should be 1,000 college professors and 15,000 students in technical schools studying for superior positions in the arts; and 20,000 teachers engaged in trade and manual training schools, instructing pupils, 400,000 in number, preparing to become skilled workmen."

In contrast with this, we have in America no technical schools of university grade, strictly speaking; and such higher technical schools as we have show on their rolls scarcely one-half as many teachers and students as Dr. Thurston's estimate calls for. The condition of secondary technical education in this country also falls far short of the German standard. In 1902 there were, in round numbers, 2,700 teachers in the United States engaged in industrial education, including the elementary as well as the secondary type of schools, and the literary as well as the mechanical subjects. Their pupils numbered altogether about 30,000 boys and 20,000 girls. Of these numbers, probably not more than 500 teachers and about 10,000 students were doing technical work of high school grade; and, if we speak of work demanding accuracy, skill and knowledge of modern principles, the numbers engaged in high school work of a technical character would be found even smaller. Technical education of this grade in the United States is probably not more than one-fiftieth as extensive as it is in Germany.

To bring this matter home, consider the number of industrial schools we would need in our own State to compare well with the German standard. Take as an example the industrial continuation schools of the kingdom of Prussia. Ten years ago, when it had about 32,000,000 inhabitants, Prussia maintained nearly 3,000 of these schools, representing various industries, and having an attendance of over 200,000 pupils. To maintain a system of the same character and proportional size, Massachusetts, with her 3,000,000 inhabitants, would need about 300 industrial schools, with a total enrollment of about 20,000. Under the same conditions as found in Prussia, 10 of these schools should be schools for practical instruction in the fundamental mechanical trades; but we actually need a somewhat larger proportion of out-and-out trades schools, for reasons to be given later. The comparison may be continued with other German States. The same statistics gave Saxony, with less than 4,000,000 inhabitants, over 200 industrial schools, with about 30,000 pupils. In Würtemburg, with somewhat over 2,000,000 inhabitants, there were 250 industrial schools and about 22,000 pupils. The largest trades schools are located in the great industrial centers. Ten years ago the city of Berlin was maintaining 21 trades schools, with an attendance of nearly 9,000 students, at an annual expense of $129,102. In addition to this sum, the city was then expending $80,000 annually for evening industrial schools, making a total of nearly $210,000 for the special training of her working classes of school age.

The variation in the number of industrial schools as compared with the population in the different German States is partly due to differences in the character of the industries; but it is worthy of note that the teaching in all these schools, while it differs in kind from that in the other schools of the empire corresponding to our secondary schools, is not inferior to it in character. It is of the highest order of technical merit. The apprentices to a certain trade are instructed by the best experts in that trade, many of whom possess general culture as well as technical knowledge. In the education of her working classes Germany is actuated by the highest ideals, and is putting them into practice. While not disregarding class distinctions, she honestly endeavors, in the interests of national progress, — industrial, commercial and political, — to make the most of the intellectual forces of her people; and to this end she spares no effort or expense to so direct her entire educational policy as to produce the highest intellectual and moral development of all her children. Her system as a whole and in many of its details is without parallel in any country, and the results are now so manifest that they excite the admiration and envy of the friends of educational reform in every part of the civilized world.

But the educational needs of our industrial classes are somewhat different from the educational needs of the working people in Germany. The German educational system was established and developed when it was a country of small shops, in which apprentices to the various trades could be taught principles and practice in a broad way. The main office of her trades schools has been to supplement this instruction by lessons in mathematics, drawing and science, with special reference to certain trades. American youth sadly need this kind of instruction, and more of it might be given them in the public schools through a wider application of the manual training idea. But when a comparison is made of the industrial systems of the two countries, it is evident that our greater need is for training in the applications of mechanical principles, and for practice to develop skill in fundamental operations. In no other country have industrial processes become so highly specialized as they have in our own. It is the intensified methods of the manufacturing industries that have well-nigh killed the apprenticeships to the trades involved; and this is why we need a relatively larger number of out-and-out trades schools than Germany does. The system of machine production which includes the man as a part of the machine has become known as the American system. It has its economic advantages; but it narrows the productive capacity of the workmen, reduces them to the level of mere machine hands, and in the end operates against industrial progress. It stimulates over-specialization, at the expense of thorough mechanical training. But such fundamental and liberal training is essential in every department of our industries; and the first duty of American trades schools, when they are established, will be to furnish such training.

Our manual training high schools have been thought by some to be capable of furnishing this needed fundamental training in mechanical principles and practice. They undoubtedly do this to a limited extent; but, as they are generally conducted, so much variety of mechanical instruction and so little practice in any one line are given that they can hardly be said to do more than give their pupils a certain appreciation of mechanical principles and processes. While this is of great value, it is manifestly not trades teaching.[1]

It is natural to inquire, however, whether the equipment of manual training high schools may not be utilized for the actual teaching of the mechanical trades within the limits of the facilities now afforded by these schools, and whether their equipment may not even be extended for the sole purpose of introducing other and various lines of trades teaching. I am well aware that this suggestion will meet with objection on the part of manual training teachers. They must not lose sight of the elements of culture, which, in the modern view, are the inspiration of their work. They should not be too much influenced by the traditions of older school systems; nor, on the other hand, should they yield everything to the demands of a practical age. Unquestionably the vocational element has already obtained a firm footing in our public schools, and it is universally conceded to be a great improvement. To extend this principle in the direction of special training is largely a question of organization and administration. It is not necessarily subversive of the so-called broader training of the high schools in general. A certificate of a trades school would, of course, not stand for the same thing for which the diploma of a literary or a manual training high school stands. This is not saying it would be less valuable; it might be more valuable. It would certainly have a different value. The real point at issue is, can the same equipment, with perhaps some necessary modifications, be utilized in the production of these two lines of educational result? There would seem to be no theoretical objection to such an attempt in a thoroughly democratic system of schools, but there are certain practical difficulties that suggest themselves.

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[1] See "Note," page 196.

One of the most serious obstacles that would stand in the way of thorough and systematic trades training in the public schools, if such teaching were attempted, is the lack of control which the public schools have upon pupils in the matter of attendance. Trades teaching involves not only instruction in principles, but long and repeated practice for the purpose of cultivating skill. The trades school that is worthy of the name must, therefore, be in a position to insist upon a term of attendance that will bear some comparison with the indentures of the old apprentice system. It is at this point, in my opinion, that the patronage of the State would need to be made most effective, if anything worth while is to be attempted through special courses. I believe it would be necessary to offer such encouragement to boys who might enter upon a course of instruction in any one of the trades as virtually to compel them to persist in it to the end. This encouragement might be given by means of small scholarships, with some system of forfeiture in case of failure to meet reasonable requirements. Pupils of our high schools, after receiving a year or two of training in mechanical drawing, book-keeping, stenography or some vocational subject, are constantly tempted to leave school when they find themselves able to earn something. Such withdrawals would be even more frequent from courses in trades instruction, unless some effective means were applied for preventing them. The tendency to seek short cuts to a wage-earning capacity might lead even to the establishment of brief and inadequate courses. The State should do everything in its power to discourage such courses. Trade and technical education, to be valuable, must attain a certain thoroughness and completeness. The trades unions claim that they are not opposed to a thorough and liberal training in the industrial arts. What they object to is the half training which they fear would be given in any system of trades schools likely to be established. The point is well taken. Such a result would not improve industrial conditions; it would simply multiply our present numbers of poorly trained and inefficient workers. The present industrial conditions are producing this result. Trades schools are proposed to counteract this very evil, but only good ones can do it. Both the industrial need and the opposing argument of the unions can be met by establishing a thorough and effective system of technical education, and, in my opinion, they can be best met in this way.

In this connection attention should be called to the fact that no school training can furnish all that is required for the best equipment of the artisan. The actual workshop must take some part in the development of the necessary manual skill, but not so large a part as it did in the old apprenticeships. Whatever method of teaching trades in schools may be adopted, provision should be made for continuing the training by at least one year of work under actual shop or factory conditions; and no certificate of proficiency should be granted until this requirement has been satisfactorily met.

Another difficulty to be met in attempting to teach trades in a manual training school would be to secure the necessary equipment and the chance to use it. This is a very practical difficulty. As a matter of fact, there are at present only 4 well-equipped manual training schools in the State and at least 2 of these are over-crowded. There can be no question about the desirability of utilizing to the fullest possible extent the buildings, machinery, tools and competent teachers of existing manual training schools. Such equipments are expensive, and it is poor economy for them to lie idle even for an hour when they might be in use. This is one of the reasons for establishing evening schools for teaching the trades that make use of such equipments; and I think there need be no hesitation about recommending evening trades schools under such a plan. It is true that these equipments are available several hours every afternoon, and that in some cases they may be made available at other times during the day without interfering with the more general work of the manual training school. Moreover, it is not impossible, when the numbers are not large, to give trades instruction to boys at the same time and side by side with boys who are engaged upon the more general exercises of ordinary manual training. Shop instruction is of necessity largely individual, and the requirements of class methods are less likely to interfere here than in other departments of school work. But these facts do not affect the general question in any large degree.

It will be observed that the introduction of special trades courses into the public school system would not necessarily mean the conversion of technical or manual training high schools into trades schools; nor, on the other hand, does it involve the introduction and development of trades teaching as a department of high school work. The great majority of boys and girls who make up the rank and file of the industrial army, and who most need the kind of instruction under consideration, leave school between the sixth and ninth grades. They are not qualified for admission to high schools, and, if they were, they could not be considered as properly belonging to the high school. To classify the work of a trades school as a part of the high school curriculum would be manifestly at variance with the prevailing idea of the true purpose of secondary education. If it were proposed to accomplish much for industrial education in this way, it would mean serious reforms in our present system of public schools, both elementary and secondary. The plan under discussion involves no such revolutionary change. It merely calls for the admission of a naturally limited number of pupils to special courses of industrial training, such as the school is or may be qualified to give. At best it could afford small relief to the industrial situation.

Another very practical obstacle in the way of any serious attempt to utilize existing educational forces for such thorough industrial teaching as is needed will be found in the character of the teaching staff of most manual training high schools, whether independent or departmental. The most essential requirement for trades teaching, as for all other effective educational work, is a thoroughly trained teaching force. In fact, such a requirement is more imperative in trades teaching than in any other line of instruction, because there are practically no books or other outside sources of information to fall back upon. It would therefore be necessary to modify and perhaps enlarge the teaching force of most schools in the direction of furnishing instructors thoroughly familiar with modern industrial methods. Much of the instruction and practice now given in our manual training schools is ineffective and out of date, from a technical point of view. It has been the fashion too often to employ as manual training teachers men or women of good general education, but of limited or even defective mechanical training. For my part, I have never sympathized with this policy. Such a policy tends to reduce the industrial value of manual training, and it has no real compensating educational value. If our manual training schools were required to employ and could secure men of the ability, skill and training required for giving sound instruction in the trades, and properly qualified in other respects for public school teaching, it would be, of course, a distinct gain for the educational side of manual training, as well as for the cause of industrial education. However valuable this might be, it nevertheless is a difficult thing to accomplish. Well-educated men and women with the necessary expert technical knowledge and skill are rare, and are not attracted by the salaries usually paid to teachers. It is comparatively easy to obtain teachers of good character and fair general training, who have enough technical knowledge to satisfy the moderate demands of most manual training schools; and, on the other hand, it is possible to find a few men who know their trade, and can teach it in a trades school. But the combination of the two, which is desirable in all manual training schools, and necessary if through special courses their work is to be distinctly industrial, would be found exceedingly difficult to bring about.

There is danger that the attempt to carry on trades training in manual training schools might, through misunderstanding of the true position of a special trades course in the schools, have an unfavorable result upon the public interest in manual training proper. It would be most unfortunate if the educational side of manual training should be lost sight of, especially in our elementary schools. Even now the public commonly regard manual training as instruction in trades, and it might lead to opposition to the extension of manual training in the lower-grade schools if the union of the two lines of manual work anywhere in the school system should seem to give a distinctly industrial bent to manual training as a whole. While correct industrial principles and methods should always be understood by teachers of manual training, their work should be governed for the most part by educational considerations; and great care should be exercised in formulating any recommendations touching manual training, in order that the correct estimate of its true value may be retained.

A reasonable objection to incorporating trades teaching into the present public school system may be found in the financial questions involved. Cities and towns are already complaining of the burden of taxation for such schools as we now have, and they will be slow to increase appropriations, even for so commendable a reform as is contemplated in the proposition to transform existing methods to include more distinct industrial training. To accomplish anything, financial assistance from the State will be necessary. If such State funds as may be granted are expended by the public school authorities, — or largely so expended, — it may be fairly questioned whether this expenditure will be made most effectively for the definite object which your Commission has in view. Might there not be a temptation to divert some, perhaps a large part, of the State funds intended for distinct industrial teaching towards the support of manual training, or some form of technical training not distinctly industrial?

It is most natural to give careful consideration to some plan for trades teaching that might utilize existing school equipments. Such a proposition is sure to suggest itself. If any attempt be made to meet it, I think it must be made through special courses offered to children below the high school age whose circumstances point toward their employment in the industries. But the objections to such a plan are strong, and there is little to commend it. Both sides of the question may be summed up as follows: —

(1) The plan of introducing special courses involves subsidizing by State funds a limited amount of special training in existing institutions, and is relatively economical and conservative. (2) The first steps thus taken in trades training under the patronage of the State might find support in the general and growing popularity of the manual training high schools, which it is proposed to utilize for this work, and in the fact that these schools are not objected to by the trades unions; but we note that there are not more than two schools which could be thus used. (3) To maintain this plan would require the employment of means designed to control attendance, and to invite or compel the completion of a thorough course of instruction and practice on the line of work chosen. (4) The trades most naturally taught in this way would be fundamental, such as drafting, joinery, wood pattern making, forging, and machine shop practice with hand and machine tools of the more general type, thus giving a training of great educational importance in the preparation of workers for the specialized industries of the State. (5) Such a plan cannot furnish large numbers of recruits for the industrial army until the manual training schools are multiplied and enlarged; it must, therefore, be regarded as a partial and somewhat tentative scheme, not likely to affect the industrial situation except in the most limited degree. (6) If the

opportunity were available in existing schools for special courses to be introduced to any considerable extent, little assistance in carrying them out could be expected from such teachers as are now employed. (7) The general experience with special courses in schools is not encouraging. They almost invariably figure as side issues, and suffer from comparison with the main effort of the school. The way to maintain special training effectively is to specialize the whole school.

There can be no question that a complete system of industrial education will require for its best interests the establishment of out-and-out trades schools, which, if given a fair chance, would probably develop rapidly, and, together with existing scientific and technical schools, form an extensive system, including a large number and a great variety of schools. The advantages of such a system are too manifest to require explanation. Distinct and independent trades schools must be the natural outcome of any sincere effort to improve industrial conditions through educational forces. To accomplish any extensive results in trades teaching, or even to do a limited amount in a thoroughgoing way, seems to me to require that the question be attacked directly, and not approached in any indirect and partial manner. The several building trades, the processes of the various branches of textile and leather-working industries, — in fact, every one of the numerous groups of expert operations that may be called a trade under the modern system of factory production or in the building industries, — can be successfully taught only in independent schools of a distinctive type. Certainly no existing schools under municipal control are fit places for teaching the principles and the skill required in the special industries of our factory towns.

A thorough system of industrial education must, it seems to me, involve not only the interests of the State at large, but sectional interests depending upon special industries. This would imply the need of expert supervision on the part of local boards composed of persons actively interested in the industries involved. The support for these schools should therefore be derived primarily from the State, and their administration determined by State authority, acting with local boards representing local industrial interests.

But there is reason to doubt the practicability of attempting the immediate establishment of such a number of trades schools as the variety of the industries of the State would seem to require. Preference must be given to the most important. There is no force in the objection that if one trade or industry be taught, all must be taught. There are degrees of need in this field, as in every other department of human activity. It is not the province of this letter, however, to discuss this point. It is only necessary to point out the relation which such distinct trade schools bear to the question at hand; and the real question is, how to get industrial education under way. The same principles as to thoroughness and a due proportion of attention to allied subjects will apply in the schools for special industries as well as in the schools for teaching the fundamental trades. The industry to be taught determines the method. We already have textile schools. The shoe and leather industries claim their share of the benefits of industrial education, and they ought to have it. The only workable plan for giving such industries educational aid under the protection of the State is, it seems to me, to give material support to the organization of such monotechnic schools as are needed in the large manufacturing centers.

It will be observed that the plans suggested are not to be considered as alternative. Each may find a place in helping to solve the general problem. Special courses in existing schools, though theoretically somewhat attractive, do not seem to me to be practicable. The best way to utilize our present equipments is through evening schools, as has been shown in Springfield. The distinct trades schools would manifestly offer the most complete solution to the problems of industrial education. Some of these problems can be solved in no other way. But, whether industrial education be developed by enlarging the work of existing institutions, or by creating new ones especially designed and equipped for the work, the industrial needs of this State require that the methods employed should be direct and practical. No indirect scheme of drawing or industrial design can furnish more than a partial answer to the peculiar needs of our industries. The study of the principles of science, art, mathematics, design, are important elements in industrial education, and should not be overlooked in any thorough scheme. They would deserve the first place, sometimes to the exclusion of practice, as is the case in the German trades schools, if our industrial conditions permitted apprenticeships like those of a former industrial age, or like those found in Germany to-day. Training for practical knowledge and skill is what our trades schools must not overlook. In this respect the French industrial schools are a better guide for us than the trades schools of Berlin. Our trades schools will fail to meet fully the peculiar demands of American industries and the need of the workers, if ample provision is not made for acquiring practical knowledge and skill.

NOTE. — *Occupations of Graduates of Manual Training High Schools.* — A study of the catalogue of 5 representative manual training high schools which have been in operation for some years shows that these schools have fostered a desire for a higher education quite as much as the ordinary high schools have done, and that very few of their graduates have become mechanics. It is fair to say, however, that the number who have gone into shops from these schools has increased somewhat in recent years; but the following statistics furnish strong evidence of the fact that the work of these schools results in general culture and training more than in the training for the trades. Of the first 613 graduates from the Northeast Manual Training School of Philadelphia, 257 entered colleges or engineering schools; of the first 520 graduates of the Central Manual Training School of the same city, 130 entered colleges or engineering schools; of the first 869 graduates of the St. Louis Manual Training School, 192 continued their education in college grade; of the first 271 graduates of the Boston Mechanics Arts High School, 91 entered scientific schools or colleges; of the first 350 graduates of the Rindge Manual Training School of Cambridge, about 100 went on to institutions of college grade. Between 700 and 800 boys received their preparation for technical and other colleges in these five large manual training high schools.

The catalogues of these schools not only reveal an evident drift into higher institutions, but they also show that the training received in these schools has not made a strong connection with the mechanical trades. The following list of occupations of graduates is arranged in the order of preference as shown by a study of these reports: —

Students,	287[1]
Clerks,	282
Draftsmen,	215
Superintendents, managers and foremen,	198
Merchants and manufacturers,	160
Civil engineers,	115
Salesmen,	95
Electrical work,	91
Teachers,	79
Lawyers,	63
Physicians,	58
Architects,	53
Machinists,	52
Electrical engineers,	48
Mechanical engineers,	36
Chemists,	33
Artists and engravers,	32
Railroad men,	22
Book-keepers,	20
Dentists,	13
Surveyors,	13
Inspectors,	12
Newspaper men,	12
Designers,	12
Insurance agents,	8
Contractors,	5
Plumbers,	5
Druggists,	4
Opticians,	4
Carpenters,	4
Clergymen,	3
Pattern makers,	3
Unclassified, or without occupation,	400
Total,	2,437

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[1] At one time, about 800 in all.